ANNUAL REPORT

EL27364
(NELLIE CREEK)

PINE CREEK NT

FOR THE PERIOD

12 JANUARY 2010 TO 11 JANUARY 2011

Pine Creek 1:100 000

PINE CREEK 1:250 000

Tenement Holder: Element 92 Pty Ltd

Date: March 2011

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Distribution: Department of Resources
Element 92 Pty Ltd (Thundelarra Exploration Ltd)

SUMMARY

EL 27364 is located about 220 km SE of Darwin and approximately 25 km NE of Pine Creek in the Northern Territory. EL 27364 was applied for on 27 May 2009 and was granted on 12 January 2009 to Element 92 Pty Ltd for a period of 3 years. It will expire on 11 January 2013.

The project area is located within central part of the pine Creek Orogen which is a folded sequence of Palaeoproterozoic pelitic and psammitic sediments, with interlayered cherty tuff units. These rocks have been intruded by the late-orogenic Palaeoproterozoic granites, causing wide spread contact/thermal aureole, which contains most of the gold and other mineralisation in the Orogen. EL 27364 covers Frances Creek and Minglo granites, and they are part of the Cullen Batholith and were emplaced during 1820 – 1850 Ma. The Frances Creek Granite crops out poorly and contains abundant xenoliths and rafts. It is felsic, fine to medium-grained, predominantly equigranular. The main constituent minerals are quartz, K-feldspar, plagioclase with minor biotite and uncommon hornblende.

The Minglo Granite crops out in the north-eastern part of the project area and most of it is covered by residual sandy soil and Quaternary alluvial deposits. It is generally medium- to coarse-grained, equigranular to porphyritic. Quartz is the most abundant mineral whereas K-feldspar and plagioclase are other felsic minerals. Biotite and hornblende (rare) are randomly distributed within the granite pluton. Geochemically both granites show high concentrations of SiO_2, Rb and low Sr, which are evidence of fractional crystallisation. They are also characterised by elevated levels of U and Th and are comparable to those high heat producing granites elsewhere.

During the reporting period, a desktop study was undertaken which suggests that these granite bodies may have some potential for uranium mineralisation. In addition, a magnetic/radiometric airborne survey was completed in August 2010 over some of the most prospective areas of the Allamber and Mary River Projects. The survey was designed to improve the company's understanding of the geology; including structures controlling on uranium mineralisation and to identify new uranium radiometric targets. Other duties included tenement administration, report writing and future planning for exploration program for the project area.

In the next reporting period, ground truthing of the project area will be undertaken. Radiometric anomalies identified from airborne radiometric survey will be examined by ground-truthing. Project area will be mapped and samples will be collected for geochemical analyses. A minimum budget of $10000.00 has been allocated to this program.

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1.0 INTRODUCTION

EL 27364 is located in the central part of Pine Creek Orogen which is host to a number of mineral commodities such as gold, uranium, iron and base metals. Mineral potential of the tenement area is in accordance with Thundelarra Exploration strategy.

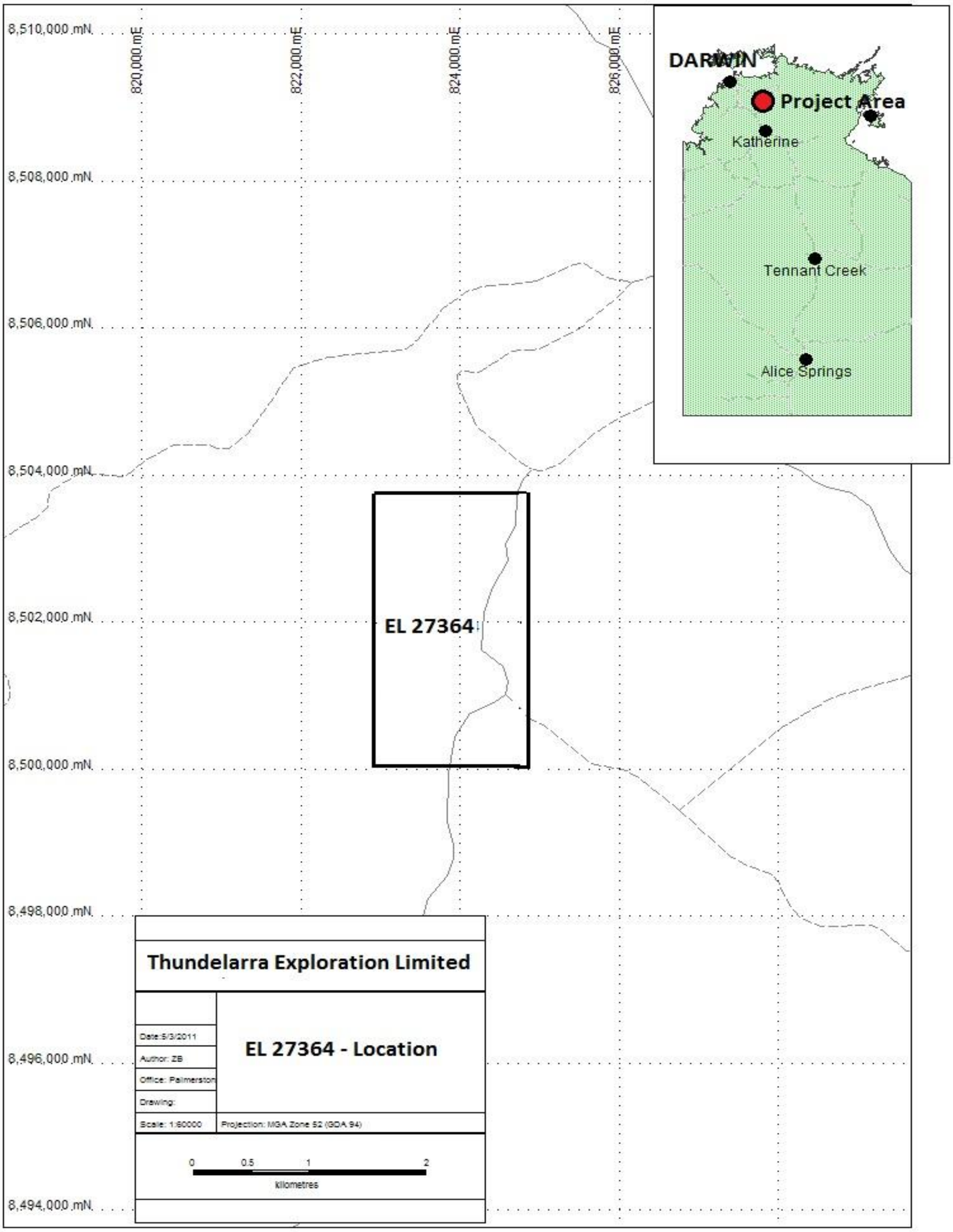
2.0 TENEMENT LOCATION

EL 27364 is located about 220 km SE of Darwin and about 30 km NE of Pine Creek in the Northern Territory (Figure 1). The license area can be accessed via the Frances Creek Road, turning north off the Kakadu Highway approximately 3km east of Pine Creek. Frances Creek Road has been ungraded to service the Frances Creek iron ore mine and is accessible through the year. About 4 kilometers south of the Francess Creek mine, a track leads from the Frances Creek road to the project area, which could mainly be accessible during the dry season. In addition, another track which comes of the 26 km mark from Pine Creek, also leads to the project area. Within the tenement access is possible by the station tracks. Nellie Creek, a main tributary of Mary Rive is located SE of the project area which joins the Mary River approximately SE of the project area. The climate is hot with periodic monsoonal rains between November and April for the remainder of the year it is warm to hot and largely dry.

3.0 TENEMENT DETAILS

EL 27364 was applied for on 27 May 2009 and was granted on 12 January 2009 to Element 92 Pty Ltd,which is a wholly owned subsidiary of Thundelarra Exploration Ltd. The tenement was granted for a period of 3 years and will expire on 11 January 2013. It has 2 blocks, encompassing 6.68 km^2. Underlying cadastre is covered by PPL 1134 held by Mary River Wildlife Ranch Pty Ltd.

Figure 1: Project Location



4. GEOLOGICAL SETTING

The project area is located within central part of the pine Creek Orogen which is a folded sequence of Palaeoproterozoic pelitic and psammitic sediments, with interlayered cherty tuff units (Needham and Stuart-Smith (1984) and Needham *et al.* (1988). These rocks have been intruded by the late-orogenic Palaeoproterozoic granites, causing wide spread contact/thermal aureole which contains most of the gold and other mineralisation in the Orogen (Bajwah, 1994). Some uranium mineralisation is also confined to contact areoles. Less deformed Mesoproterozoic sedimentary and volcanic sequences unconformably overlie the Palaeoproterozoic rocks and is overlain by Cambrian-Ordovician lavas, sediments and Cretaceous strata. Cainozoic sediments, laterite and recent alluvium may obscure parts of the Orogen lithologies.

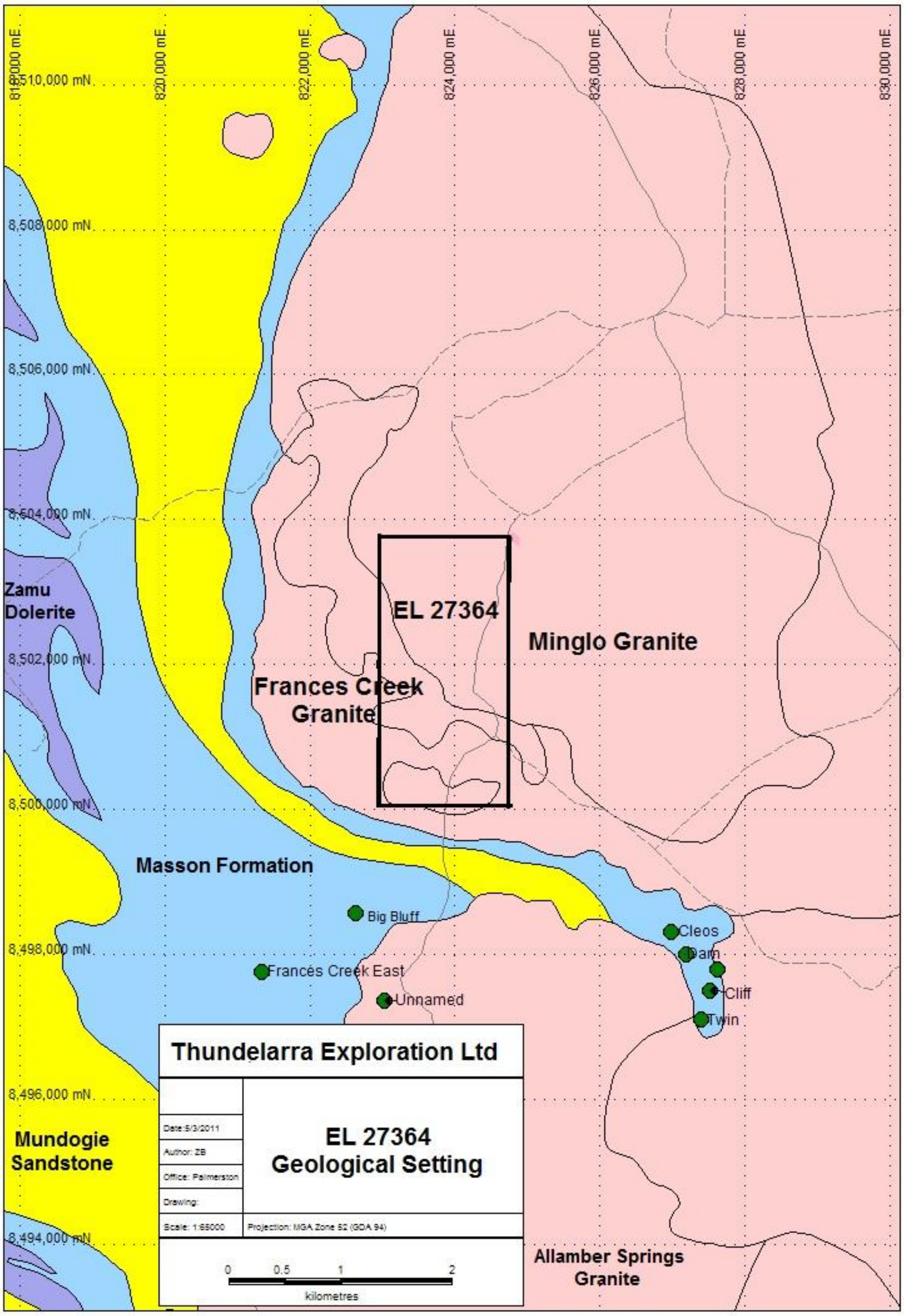
Local Geology

EL 27364 mainly covers Frances Creek and Minglo granites (Figure 2) which are part of the Cullen Batholith and were emplaced during Top End Orogeny (1870 – 1780 Ma). The members of the Cullen Batholith are predominantly I-type (Chappell and White, 1974), but some may also have S-type characters.

The Frances Creek Granite crops out poorly in creek beds and as isolated pavements and scattered boulders, separated by sandy plains (Bajwah 1994). The granite contains abundant xenoliths and rafts up to several kilometers. It is felsic, fine to medium-grained, predominantly equigranular, although in some areas it may contains K-feldspar phenocrysts, defining porphyritic fabric. The main constituent minerals are quartz, K-feldspar, plagioclase with minor biotite and uncommon hornblende. Accessory minerals are magnetite and zircon which are randomly distributed in the matrix.

Geochemical analyses of the Frances Creek Granite show that it has a narrow range of SiO_2 (70.93 wt%. - 76.08 wt%), which is considered to be felsic in nature. TiO_2 and $FeO_{(t)}$ are low as reflected in the presence of mafic minerals. Na_2O lies in a moderate range (2.83 – 3.46 wt%) and subordinate to K-feldspar. Rb abundance varies 213-324 ppm, whereas Sr ranges from 56 – 151 ppm; this suggests that granite body is moderately fractionated. An important feature of the Francess Creek Granite is that it contains elevated levels of uranium (6-73 ppm) and Th (38 – 87 ppm) contents.

Figure 2: Geological setting of the project area



North-eastern part of the tenement is covered by the Minglo Granite (Figure 2) which is also member of the Cullen Batholith. Much of the granite body is covered by residual sandy soil and Quaternary alluvial deposits of the Mary River. The pluton forms semi-continuous outcrops of rugged hills along the eastern side of the Minglo Creek, elsewhere outcrop is restricted to low boulder hills and isolated tors and pavements. It intrudes the Palaeoproterozoic metasediments, causing contact metamorphism which contains several Sn and Sn-sulfide prospects/deposits towards north.

The Minglo Granite is generally medium- to coarse-grained, equigranular to porphyritic. Quartz is the most abundant mineral (up to 35%) whereas K-feldspar and plagioclase are other felsic minerals. Biotite and hornblende (rare) are mafic minerals which are randomly distributed within the granite pluton. Accessory minerals are sphene, and magnetite along with rare minerals such as allanite, apatite and zircon. Felsic nature of the granite is shown by SiO_2 content which ranges from 72.12 – 75.38 wt%. $FeO_{(t)}$ and MgO are in restricted range and are low in concentrations. Na_2O is consistently higher whereas K_2O is moderately high but in narrow range (Bajwah, 1994). Trace elements such as Rb and Ba are in moderate range, varying from 167 – 310 ppm and 177 – 691 ppm. Sr is low and decreases in response to SiO_2 rise, where as Rb increases when plotted against Sr, which is indicative of feldspar fractionation.

Mineral Potential

Bajwah (1994) suggested that fractionated members of the Cullen Batholith have genetic link with the gold, uranium and base metal mineralisation present in the adjacent metasediments. A number of studies carried out, so far, indicate that elevated levels of gold, uranium and base metals within a number of plutons indicated that granites were fertile rocks, which generated hydrothermal systems that led to releasing of metal-rich fluids which were responsible for gold, uranium and base metals mineralisation in the structurally prepared sites mainly in contact areoles. Uranium and base metal mineralisation has been discovered in the south and south-east of the project area (Figure 2). Amongst these, Cleo project (Dam and twin prospects) is the most significant, where a JORC inferred resource of 1.4 Mt @ 304 ppm U_3O_8 containing 960, 000 lbs U_3O_8 (100 ppm cut-off) has been delineated (Atom Energy Limited, ASX Release 26 March 2008). Some drill holes have also intersected copper mineralisation up to 2.45%. Here, mineralisation is confined to fault structure/shear zone within a north northwest-trending embayment at the margin of the Allamber Springs Granite. Mineralised zones are hosted by graphitic schist of the Masson Formation, granitic rock and dolerite.

Uranium mineralisation occurs as closely spaced veins of uraninite within or on the margins of the faults, and is associated with chloritic, sericitic and hematitic alteration. Uranium mineralisation has also been discovered within shear zones in the Tennyson Granite (southern extension of Cullen Batholith). These shear zones are generally greisenised or silicified.

The Allamber Springs and Tennyson Granites both are fractionated and characterised by high heat producing elements (e.g U, Th), and have produced uranium mineralisation either in the contact zones or within granite bodies preferably in shear zones. The Frances Creek and Minglo Granites both show elevated levels of U and Th concentrations which along with fractionated character define the prospectivity of these granites or their contact zones. In the light of above discussion, following exploration strategy can be derived:

- Shear zones act as conduits, transporting uranium from the hot granite into the sediment package.
- Local structural settings and / or rheological contrast (shale / dolomite contact) leads to an area where high fluid flow and wall-rock interaction takes place.
- A suitable reductant interacting with the fluid leads to precipitation of the uranium (graphitic or sulphidic shale or dolomite).

5.0 PREVIOUS EXPLORATION ACTIVITY

The project has been explored moderately in the past. It was mapped by BMR in 1950's which provided our understanding of geological setting of the area. The project area was remapped as part of Pine Creek (1:250 000) sheet (Ahmad et al. 1993) which led to some re-interpretation of geology of the area along with metallogenesis. Airborne geophysical cover of the project is available from the Northern Territory Geological Survey, Darwin (WGC 1999).

On ground exploration commenced in 1970's when a consortium led by Australia Geophysical Survey Pty Ltd (Cotton et al. 1973) flew for radiometric cover of the area. Airborne radiometric survey identified several uranium anomalies which were drilled tested. However, assaying of drill samples did reveal any significant uranium or base metal mineralisation, and eventually tenement was surrendered. Following this, CRA commenced exploration of the area under EL 1094 (Wills and Kennedy 1978). Only a small portion of the current project area was covered under this program. Geological mapping and soil/rock sampling was undertaken for base metals. Some anomalies were identified on the metasediments while no significant values were recorded in the area covered by granite.

In 1980, exploration of the project area was undertaken by Australia and New Zealand Exploration Company (Davies, 1981). It mainly involved geochemical sampling program for uranium and base metals which was unsuccessful, and as a result of that EL 2094 was surrendered.

Total Mining Australia explored southern part of the tenement in 1980's but mainly concentrated on the metasediments in the embayment area for hydrothermal uranium deposits (Berthault,1989: Earthrowl, 1989). Exploration program involved detailed geological mapping, radiometric survey and geochemical sampling. This program led to the discovery of Cleo, Twins, Dams and other uranium prospects in the area.

Casey and Casey (1989) explored part of the project area for tin and gold mineralisation. However, their efforts were mainly confined to the contact areoles metasediments. Their exploration efforts did not meet any success.

NE part of the project area was assessed for tin and gold mineralisation under expired EL 6261, which was granted to Robert Johnston. Metasediments in the contact zone were the main area of study. The Frances Creek and Minglo Granites were not considered prospective for gold and tin mineralisation.

Under EL 7138 (expired), southeastern part of the project area was explored for base metal mineralisation (Earthrowl, 1992). This program reviewed previous exploration program, re-interpreted the geological setting and recommended soil sampling program in the project area. In the following years, systematic soil sampling program was conducted for iron, base metals and gold. In 1993, part of the current project area was flown by geophysical survey (Butler, 1994). However, these programs found no success for sizeable economic deposit. In 1994, EL 7138 was again explored by Nicron Resources Limited as part of the JV (Melville, 1995) and found no encouragement for base metals; however, some gold anomalies were recorded during this exploration program. Area covered by granites was neglected in his episode of exploration. After a thorough review by Earthrowl (1996) the tenement was surrendered because no significant base metal or gold anomalies were discovered, although the tenement which covered the Mingle Granite and Frances Creek Granite were not explored.

Part of the project area was explored by Aztec Mining Limited in 1993 under SEL 8032 (Butler, 1994b). Geophysical survey and geochemical survey programs were undertaken which mainly targeted metasediments, located outside the current tenement and did not identify any significant mineralisation.

6.0 EXPLORATION YEAR ENDING 12 January 2011

During the reporting period a desktop study of the project area was undertaken together with airborne radiometric and magnetic survey. For desktop study, historical reports covering previous mapping and exploration programs were obtained and reviewed in order to assess mineral potential of the project area.

EL 27364 underlies rocks of the Frances Creek and Minglo Granites and their mineral potential is untested so far. A petrological and geochemical study of these Palaeoproterozoic granites show that they are I-type and are moderately fractionated as shown by the elevated levels of Rb and Ba contents; Rb increases with rise in SiO_2 contents. In addition, U and Th contents are high which are characteristics of high heat producing granites. These characters are similar to those granites which during ascent and fractionation of granitic magma can lead to evolution of hydrothermal systems responsible for a variety of mineralisation in the adjacent metasediments or within the granite bodies (Bajwah, 1994; Cameron and Hattori, 1987).

In the Pine Creek Orogen, a genetic link between members of the Cullen Batholith and gold, uranium and base metals mineralisation has been suggested (Bajwah, 1984). Although, faults/shears along with graphitic horizons appear to be more suitable sites for the deposition of mineralisation. However, it should be noted that very little exploration of granites has taken place. In the Pine Creek Orogen, it is uncommon to find significant mineralisation within granite apart from uranium mineralisation present in shear zones which are present with Tennyson Granite. It is possible that similar type of mineralisation may also be present within the Frances Creek and Minglo Granites as shown by radiometric survey (Figure 3).

Airborne Radiometric/Magnetic Survey

A magnetic/radiometric airborne survey was completed in August 2010 over some of the most prospective areas of the Allamber and Mary River Projects. The survey was designed to improve the company's understanding of the geology; including structures controlling uranium mineralisation and to identify new radiometric targets for uranium.

The survey was completed by Thomson Aviation Pty Ltd using an Air Tractor fixed wing aircraft. East-west lines were spaced 70m apart, and 89 line km flown over EL 27364. Survey specifications and GDF formatted data are given in Appendix 1.

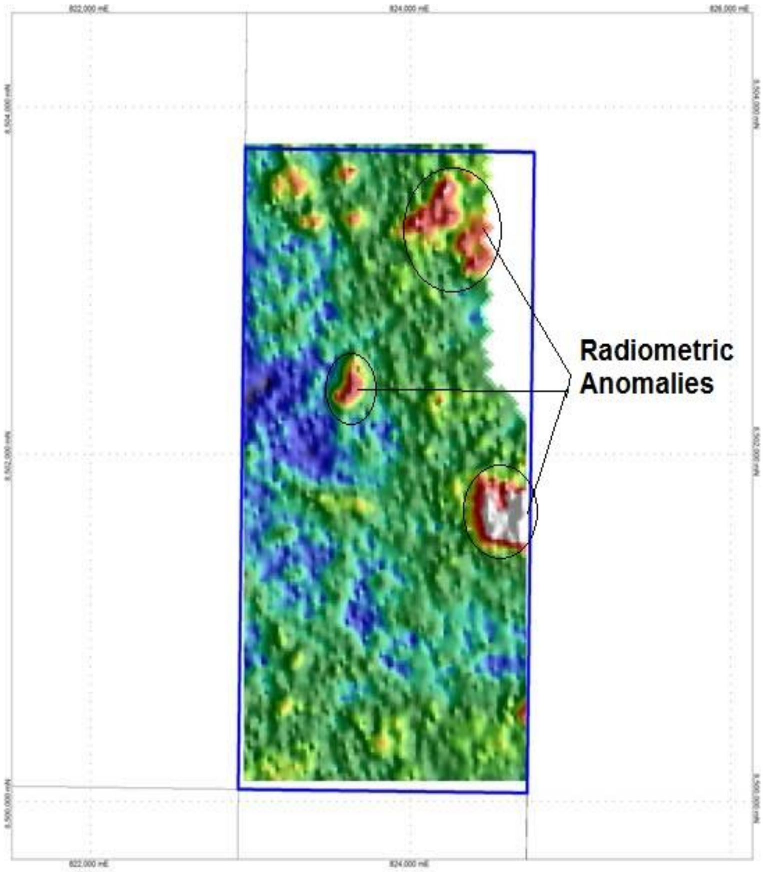
Modeling of the raw data was completed by Southern Geoscience Consultants in Perth and identified three uranium radiometric anomalies (Figure 3) for follow up work/reconnaissance.

This exploration program incurred a cost of $8410.00 and details are given Appendix 2.

7.0 PROPOSED EXPLORATION PROGRAM

During the next reporting period, open file data review and compilation of data will take place. In addition, ground truthing of the project area will be undertaken to examine radiometric anomalies identified from recent airborne geophysical survey. Project area will be mapped and soil/rock chip samples will be collected for geochemical analyses. A minimum budget of $10 000.00 is proposed for this program.

Figure 3: Radiometric image of EL 27364 (U_Eshade_L)



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Appendix 1:

Thomson Aviation Pty Ltd

Technical Report

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                          Thomson Aviation Pty. Ltd.

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                        GEOPHYSICAL SURVEY DATA REPORT

________________________________________________________________________________
                                                    Date : 22 September 2010

   This readme file describes the equipment and specifications of a geophysical
   airborne survey conducted by Thomson Aviation Pty. Ltd.
   The readme also summarises the data processing parameters and procedures
used.



   CLIENT DETAILS
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  Company Flown for:  Element 92 Pty Ltd
  Company Flown by :  Thomson Aviation Pty. Ltd.
  Company Processed:  Thomson Aviation Pty. Ltd.
  Company Job      :  Thomson 10002.



  AIRBORNE SURVEY EQUIPMENT:
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  Aircraft                          : Air Tractor 502B VH-AVN
  Magnetometer                      : Geometrics G822A
  Magnetometer Resolution           : 0.001 nT
  Magnetometer Compensation         : Post Flight
  Magnetometer Sample Interval      : 20 Hz, Approx 3.75 meters
  Data Acquisition                  : GeOZ Model 2010
  Spectrometer                      : Radiation Solutions RS 500
  Crystal Size                      : 66 lt downward array
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Spectrometer Sample Interval     : 0.5 Seconds (approx 37 meters)
GPS Navigation System            : Novatel OEMV-1VBS GPS Receiver


AIRBORNE SURVEY SPECIFICATIONS
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Area 1A: Pine Creek, NT

Flight Line Direction            :    090 - 270  degrees
Flight Line Separation           :          70  metres
Tie Line Direction                     :    000 - 180  degrees
Tie Line Separation              :         700  metres
Terrain Clearance                :          30  metres (MTC)
Survey flown                     :       August  2010


Area 1B: Pine Creek, NT

Flight Line Direction            :    045 - 225  degrees
Flight Line Separation           :          70  metres
Tie Line Direction                     :    135 - 315  degrees
Tie Line Separation              :         700  metres
Terrain Clearance                :          30  metres (MTC)
Survey flown                     :       August  2010



DATUM and PROJECTION
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Datum                           :  Geodetic Datum of Australia 94.  GDA94
Projection                      :  Map Grid of Australia.  MGA
Zone                            :  Zone 52


RADIOMETRIC PROCESSING PARAMETERS:
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                    Tot.Count    Potassium   Uranium     Thorium
Arcft Bkg           238.50       23.25       11.56       2.78
Cosmic Bkg          1.4769       0.0840      0.0765      0.0558
Height Attn         0.007434     0.009432    0.008428    0.00751
CPS to equivalents  85.902       351.026     22.894      16.467
(at 30 meters ground clearance)


RADIOMETRIC STRIPPING RATIOS:
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             Alpha = 0.276          a = 0.048
             Beta = 0.418           b = 0.003
             Gamma = 0.759          g = 0.001
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DATA PROCESSING : MAGNETIC DATA

MAGNETIC PROCESSING FLOW

The final magnetic data processing was performed using the following processing flow:

- Aircraft magnetic data QC
- Diurnal magnetic data QC
- System parallax removal
- Diurnal variation removal and addition of the mean diurnal base value
- IGRF removal and addition of mean IGRF value.
- levelling using polynomial Tie line levelling,
- Micro levelling if required
- Reduction to the pole.
- Gridding using Minimum Curvature algorithm

MAGNETIC QUALITY CONTROL

The processing of the magnetic data firstly involved the routine quality control in the field of both the aeromagnetic and diurnal data during the acquisition phase. Any data found not meeting the required specifications were reflown.

MAGNETIC PARALLAX CORRECTION

The total magnetic intensity aircraft data was firstly corrected for the effects of system parallax. The parallax parameters were determined and checked from the results of opposing test line flights.

MAGNETIC DIURNAL CORRECTION

The base station magnetometer data was edited and merged into the main database. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations. There were no magnetic storms recorded by the diurnal monitoring station during the survey. The mean value was then added back to the data.

MAGNETIC IGRF CORRECTION

The data was corrected for the regional gradient of the International Geomagnetic Reference Field (IGRF). The IGRF was calculated for every point along the lines with respect to GPS height using the IGRF Model for 2010 with secular variation applied. The mean IGRF value was then added back to the data.

MAGNETIC PROFILE LEVELLING

The magnetic traverse line data was then statistically levelled from the tie line data using

Intrepid polynomial levelling. The steps involved in the tie line levelling were as follows:

- A primary tie line was chosen as a reference tie.
- All other ties were levelled to this tie line using 1st degree polynomial adjustment.
- lines were adjusted individually to minimize crossover differences, using 2nd degree polynomial adjustments.

Any residual flight line effects were removed using Intrepid micro levelling techniques and the resultant line data saved as a separate field.

MAGNETIC GRIDDING

The data was gridded to a cell size of 25% of line spacing using Minimum curvature algorithm.

DATA PROCESSING : RADIOMETRIC DATA

RADIOMETRIC PROCESSING FLOW

Radiometric data processing consists of the following processing flow:

Full spectrum 256 channel Overview:

- Noise Adjusted Singular Value Deconvolution (NASVD) noise reduction (First 8 Principal Components)
- Dead Time correction
- Energy calibration
- Cosmic and Aircraft background Removal.
- Radon background Removal
- Extraction of IAEA Window data

Windowed data processing Overview:

- Compton Stripping correction.
- Height Attenuation correction using IAEA coefficients.
- Gridding

The specific processing steps are described below:

256 CHANNEL PROCESSING

NASVD Noise Reduction:

Noise-Adjusted Singular Value Decomposition (NASVD) Smoothing. Correction of the radiometric data involved the reduction of the 256 channels of raw gamma spectrometer data using Noise-Adjusted Singular Value Decomposition (NASVD) noise reduction method. The signal to noise ratio of the multi channel spectra can be substantially enhanced using Noise-Adjusted Singular Value Decomposition (NASVD) as described by Hovgaard and Grasty (1997), Schneider (1998) and Minty (1998).
This method involves a general linear transformation of groups of spectra (a whole line or flight), using NASVD to compute the different spectral shapes that make up the measured multi-channel spectra. New multi-channel spectra are created by recombining the statistically significant spectral components. Each spectral component contributes an unequal amount to the features observed in the measured multi-channel spectrum, until a point is reached where the spectral components represent only noise.

The 1st spectral component is the spectral shape that represents most of the features in the measured multi-channel spectra. The 2nd spectral component represents those features not described by the 1st spectral component, etc. By excluding from the recombination those spectral components that do not represent significant features in the measured multi-channel spectra, the resulting reconstructed multi-channel spectra have a much larger signal to noise ratio than the measured multi-channel spectra.

Dead Time Corrections:

The raw 256 channel spectra were corrected for spectrometer dead time using the recorded live time and the standard formula.

$$N = n / (1 - t)$$

N = corrected counts in each second;
n = all counts processed in each second by the ADC; and
t = the recorded dead time

Where the live time (L) is recorded, the dead time t is replaced by (1 - L).

Energy Calibration:

Energy calibration was undertaken line by line using a maximum of 3 calibration peaks; and a minimum of 2 calibration peaks dependent upon their clear identification in the spectra. The 3 calibration peaks used were Bi 214 at 0.609 Mev, K-40 at 1.46 Mev and Tl-208 at 2.615 Mev

Cosmic and Aircraft Background Correction:

Cosmic and aircraft background removal utilised the data recorded from a series of calibration flights
over water. These flight produce a normalised cosmic spectra for the system installation, together with
a 256ch spectra for the aircraft background.
The combined correction is calculated using:

N = a + bC,

where:

N = the combined cosmic and aircraft background in each spectral window;
a = the aircraft background in the window
C = the cosmic channel count; and
b = the cosmic stripping factor for the window.

The values of a and b for each window are determined from the calibration flights over the sea.
Cosmic coefficients and aircraft background coefficients were derived using INTREPID CAL256 program.

Atmospheric Radon:

The influence of atmospheric radon has been minimised using the spectral ratio method described by
Minty (1992). However the effect of radon in the Uranium channel can be considerable; and some
effects of the radon are visable in the character of the final processed data.

Extraction of Four Standard Windows:

The fully processed 256 channel spectra were reduced to the four IAEA (1991) standard windows or
Regions of Interest (ROI): As given by the following Energy windows and channel numbers:

Total Count	0.41 to 2.81 Mev	(channels 33 to 238)
Potassium	1.37 to 1.57 Mev	(channels 116 to 133)
Uranium	1.66 to 1.86 Mev	(channels 140 to 158)
Thorium	2.41 to 2.81 Mev	(channels 205 to 238)

WINDOW PROCESSING

Spectral Stripping of Standard Window Data:

Corrections for Compton stripping and height attenuation were applied to the windowed
data using constants supplied by Radiation Solutions Inc.
Due to scattering of gamma rays in the air, the three principle stripping ratios
(Alpha, Beta and Gamma) increase with altitude above the ground:

Stripping Ratio	Increase at STP per metre
Alpha	0.00049
Beta	0.00065
Gamma	0.00069

Following adjustment of the stripping ratios for altitude, the technique for producing the corrected (stripped) count rates in the potassium, uranium and thorium channels (NKC, NUC and NThC) are given by Grasty and Minty (1995)

The Compton coefficients for the system are given above:

Height Corrections

The stripped count rates vary exponentially with aircraft altitude. Adjustments for variation in altitude were made using the formula:

$$Nc = No\ e^{-u(H-h)}$$

Where No = uncorrected counts,
Nc = count rate normalised to height H,
h = measured height above the ground,
H = nominal flight height,
u = attenuation coefficient for the channel being corrected.

Calculation of Effective Height

The Effective Height, which is the aircraft terrain clearance corrected to Standard Temperature and Pressure was determined as follows:

- Filtering of the temperature field was applied to remove spikes and smooth out the instrument noise.
- Filtering of the barometric pressure field was applied to remove spikes and to smooth out the instrument noise.
- Filtering of the radar altimeter was applied to remove spikes, spurious reflections from groups of tree and very narrow gullies and to smooth out the instrument noise.
- The formula option in the spread sheet editor was used to combine the terrain clearance, pressure and temperature.

$$E\_height = \frac{h \times P \times 273}{1013 \times (T + 273)}$$

Where:

E_height = the effective height;
h = the observed radar altitude in metres;
T = the measured air temperature in degrees C;
P = the barometric pressure in millibars.

Reduction to Ground Concentrations:

The fully corrected window data is then converted to effective ground concentrations by dividing
by the conversion coefficient to produce the following equivalent concentrations for each element.

```
Total Count    : Dose Rate
Potassium      : Percent
Uranium        : PPM
Thorium        : PPM
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Radiometric gridding

The data was gridded to a cell size of 25% of line spacing using Minimum curvature algorithm.

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For further information on the data processing please contact Thomson Aviation Pty. Ltd. directly.

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