2007 ANNUAL REPORT
EXPLORATION LICENCE 24841,
MURPHY PROJECT, NT


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August 2007
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EXECUTIVE SUMMARY

This annual report describes the work carried out in EL 24841 up to the 31/7/2007. EL 24841 is located over the western end of the Murphy Inlier, NT and is held by Canon Investments Ltd; a whole owned subsidiary of Buffalo Gold Ltd. The exploration licence was acquired because the area is believed to have accessible strike lengths of the unconformity between the early Proterozoic Murphy Inlier and the middle Proterozoic McArthur Basin, in particular the Westmoreland Conglomerate. Concealed southern extensions of the Emu Fault Zone are also thought to cut the area. Consequently EL 24841 is seen as having the potential to host unconformity-type uranium deposits, similar to those located in the Alligator Rivers Uranium Field at the northern end of the McArthur Basin.

Work during this period comprised a review of past exploration, an airborne EM/magnetic survey and a comprehensive mineral assessment, incorporating the airborne survey in addition to public domain geological, geochemical and geophysical data. The aim of this work was to (i) to map the lower Proterozoic and mid Proterozoic rocks, under the Phanerozoic cover; (ii) identify possible uranium source rocks, (iii) locate regional/local structures that display alteration indicating the passage of oxidised fluids; and (iv) map conductive graphitic units or clay alteration in the basement rocks. These geological features were then used in conjunction with radiometric and geophysical data to select target areas for uranium mineralisation.

Results of this work located six target areas, which extend on to an adjacent EL held by Buffalo Gold Ltd. A follow-up radon track-etch survey with air-core drilling are planned to defined prospects within these target areas. The EM survey and mineral assessment also found highly conductive mafic dyke and sill like complexes which are thought to be feeder zones for some of the flood basalts found in the southern part of the McArthur Basin. Eight “high risk” Cu-Ni targets areas associated with these mafic complexes were also selected. It is planned to evaluate the best of these targets via drilling to confirm the potential for this type of mineralisation in the area before more extensive exploration is carried out.
1 INTRODUCTION

Buffalo Gold Limited, through its wholly owned Australian subsidiary Canon Investments Ltd, is the holder of EL 24694. The licence is located west of the Westmoreland Uranium Field and forms part of Buffalo Gold Ltd’s Murphy Project targeting uranium deposits about the Murphy Inlier in the Northern Territory. The Murphy Project is currently made up of ELs 24694 and 24841, and ELAs 25708, 25709, 25710, 26138, 26139 and 26140 (see Figure 1).

This annual report covers all the exploration work carried out within EL 24841 up to 31/7/2007. The work during this period was directed at determining whether the covered region has the potential to host economic uranium mineralisation and the selection of target areas. Exploration activities involved an extensive review of previous exploration, an airborne EM and magnetic survey and detailed mineral assessment aimed at selecting uranium targets. Results of this work highlighted several uranium and possible copper-nickel targets that will be followed-up with ground work in the next exploration period.

2 LOCATION & ACCESS

EL 24841 is located approximately 130km west of the NT - QLD border and 170km south east of the McArthur River mine in eastern NT, see Figure 1. The licence covers four 1:250,000 map sheets; Wallhallow, Burnette Downs, Calvert Hills and Mount Drummond. Access is via the Creswell Downs–Calvert Hills road, which crosses the border near Wollogorang.

Figure 1. Location map.
3  TENURE DETAILS

EL 24841 was originally taken out by Global Discovery Pty Ltd and was acquired from them by Canon Investments Pty Ltd (a wholly owned subsidiary of the Canadian company, Buffalo Gold Limited). Buffalo Gold Ltd are the current operators of the licence. Tenement details are shown below in Table 1.

Table 1. Tenement details.

<table>
<thead>
<tr>
<th>Exploration Licence No.</th>
<th>No. Blocks (Area km²)</th>
<th>Grant Date</th>
<th>Expiry Date</th>
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<td>297</td>
<td>(971)</td>
<td>1/8/2006</td>
<td>31/7/2012</td>
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</table>

Exploration expenditure for this period totaled $ 118,480 and a break is provided in the Expenditure report in Appendix 1.

4  REGIONAL GEOLOGY

The Murphy Project area is located on the western end of the Murphy Inlier. The inlier is referred to as the Murphy Tectonic Ridge and represents a belt of lower Proterozoic basement that separates the middle Proterozoic McArthur Basin to the north and the middle Proterozoic Lawn Hill Platform - South Nicholson Basin to the south (See Figure 2). The oldest rocks in the region are the lower Proterozoic Murphy Metamorphics, which form the basal unit of the Murphy Inlier, and consist of isoclinally folded greenschist facies metasediments; typically quartz-feldspar-mica schists and gneiss with minor graphitic units. The Murphy Metamorphics form the core of the Murphy Tectonic Ridge and only outcrop in the NT portion of the inlier. The Cliffdale volcanics unconformably overlay the Murphy Metamorphics and are made up of a series of felsic volcanic and volcaniclastic rocks. The Cliffdale volcanics are only found at the eastern end of the inlier. Both the metamorphics and volcanics are intruded by granites and adamellites of the Nicholson Granite Complex which constitutes the majority of the rocks found in the inlier.

The northern margin of the Murphy Inlier is unconformably overlain by the Westmoreland Conglomerate, which is the oldest unit in the middle Proterozoic Tawallah Group, and marks the base of the southern portion of the McArthur Basin. The Westmoreland Conglomerate is made up of four sub-units; (i) a basal volcanic derived (sourced from the underlying Cliffdale volcanics) conglomerate-breccia that grades up into a pebbly quartz sandstone; (ii) an upward fining coarse to medium grained ferruginous sandstone; (iii) a coarse polymictic conglomerate and minor pebbly sandstone, which can be reverse faulted directly on the Cliffdale Volcanics; and (iv) a porous, crossbedded, coarse grained quartz sandstone, with minor conglomerate bands and laminated tuffaceous siltstone in the lower part. The Seigal Volcanics lie conformably on top of the Westmoreland Conglomerate and consist of massive and amygdaloidal tholeiitic basaltic lavas with minor interbedded siltstones and sandstones. A thin shale bed is commonly found at the base of the Seigal Volcanics and marks the hiatus between deposition of the Westmoreland Conglomerate and the start of volcanism. The middle to upper Tawallah Group consists of interbedded sediments and volcanics. Sediments and volcanics of the McArthur Group lie unconformably over the Tawallah Group.
The southern margin of the Murphy Inlier is unconformably overlain by several belts of Lawn Hill Platform in addition to sediments of the south Nicholson Basin, which unconformably covers the Lawn Hill Platform successions. A thin unit of coarse sandstone and conglomerate, the Wire Creek Sandstone, marks the base of the Lawn Hill Platform in places and is conformably overlain by the Peters Creek Volcanics; a massive sequence of alternating basalt, rhyolite and rhyodacites with minor sediments. Both units can be found lying unconformably on the Murphy Inlier and are considered equivalents to the Tawallah Group in the McArthur basin. The Peters Creek Volcanics are unconformably covered by the Fickling Group, a sequence of conglomerates, sandstones, siltstones and dolomites. The Fickling Group belongs to the Land Hill Platform and in the area of the Murphy Inlier is unconformably covered by shallow marine sediments of the South Nicholson Basin referred to as the South Nicholson Group. This group is also found lying unconformably over the western end of the Murphy Inlier or over the Benmara Beds, which can lie unconformably between the South Nicholson Group and the Murphy Metamorphics. The Benmara Beds are also a middle Proterozoic Tawallah Group equivalent and consist of a mixed rhyolite, trachyte, sandstone and conglomerate package.

![Figure 2. Simplified regional geology.](image)

Phanerozoic cover consists of mostly early to middle Cambrian sediments and basalts, and Cainozoic sediments. Outcropping of Proterozoic rocks in the project area suggests that Phanerozoic cover is not thick here, although locally developed thin Cambrian Antrim Plateau Basalt flows have been noted in magnetics to the north.
Structurally, the region is cut by a dominantly NW trending series of faults and joints paralleling the Calvert fault. Possible NNW trending extensions of the Emu Fault also pass through the west side of the region under the Phanerozoic cover. A second set of NE trending faults can also be seen paralleling the structural trend of the Murphy Tectonic Ridge. Both sets of faults commonly consist of high angle normal and reverse faults whose intersection appears to form structural blocks displaying horizontal movement and/or tilting. Lateral movement is also common in the NW trending structures. Numerous mafic, commonly doleritic, dykes parallel the faulting and are thought to be cogenetic with the mid Proterozoic volcanics of the Tawallah Group.

Small stratabound disseminated lead-zinc±copper occurrences, associated with carbonaceous units are found within both the McArthur and Lawn Hill Platform – South Nicholson Basins. Copper mineralisation occurs as unconformity related and breccia pipe occurrences in the region. The latter deposit type forms sub-economic deposits in the Redbank area (Figure 2) which were mined on a small scale in the post war era. Minor tin occurrences have also been found around the Nicholson Granite Complex.

The region is best known for the uranium deposits at Westmoreland (Figure 2); notably the Redtree deposit (12,600t U_3O_8), the Junnagunna deposit (5,300t U_3O_8) and the Huarabagoo deposit (3,000t U_3O_8). Mineralisation in these deposits occurs as sandstone hosted uranium within the upper sandstone unit of the Westmoreland Conglomerate, directly below the contact with the Seigal Volcanics, and shows a strong association with fault hosted mafic dykes and sills. Minor mineralisation is also found within other units of the Westmoreland Conglomerate and in shear zones at the unconformity between the Cliffdale Volcanics and Westmoreland Conglomerate. Clusters of minor uranium occurrences area can be found to the west and east of the Westmoreland area, along the northern margin of the Westmoreland Conglomerate. To date only minor unconformity type uranium mineralisation has been found at the unconformity between the Murphy Metamorphics and the Westmoreland Conglomerate.

5 EXPLORATION PHILOSOPHY

Buffalo Gold Ltd believes that the covered regions about the western end of the Murphy Inlier have not been adequately explored and have the potential to host high grade uranium mineralisation. The uranium mineralisation is envisaged to be either; (i) unconformity type uranium deposits located at the lower Proterozoic –mid Proterozoic uniformity between the Murphy Metamorphics and Westmoreland Conglomerate, similar to those found in the Alligator Rivers Uranium Field, NT; or (ii) sandstone hosted uranium deposits associated with the upper unit of the Westmoreland Conglomerate, below the contact with the Seigal volcanics, similar to those found in the Westmoreland uranium deposits, QLD.

6 SUMMARY OF PREVIOUS WORK

A comprehensive review of previous mineral exploration was carried and an outline is presented in Appendix 2. Important information gained from this review are;
First recorded work in the area was by Mount Isa Mines in 1956 and consisted of crude airborne radiometric surveys. The results of this work located the Westmoreland deposits and most likely all of the significant outcropping occurrences.

There was a distinct hiatus in exploration between 1963-1970, reflecting a slump in the global demand for uranium; the post war proliferation of nuclear weapons had slowed and the nuclear power industry was still in its infancy.

A second wave of exploration commenced in the 1970’s as the demand for uranium for use in nuclear power stations increased. Many of the companies were also operating in the Alligator Rivers region, at the northern end of the Pine Creek fold belt, and much of their focus was on this area after the discovery of significant deposits at Jabiluka, Ranger, Nabarlek and Koongarra. The similarity between the two areas was known, however at this time the nature of the Alligator Rivers deposits was poorly understood and exploration was targeted toward roll front and sandstone hosted uranium deposits in both areas. By the time unconformity type uranium deposits were understood, uranium exploration restrictions were in place and work did not resume in the area until recently.

More detailed radiometric surveys have been carried out. This work has revealed many outcropping anomalies related to brecciation, quartz veining (silicification) and iron-metasomatism (ferruginisation) associated with faulting in the Nicholson granite and Murphy Metamorphics. None of these anomalies appear to warrant follow-up work, however they indicate that processes associated with the formation of unconformity type uranium deposits have been active in the early Proterozoic basement.

The region has been explored for gold, basemetal (sedex type deposits) and kimberlite hosted diamonds by several major companies. No significant gold or basemetal discoveries were made. A large number of diamonds were recovered from Ashton’s Creswell prospect outside the licence and the area is currently under a ERL.

An airborne GEOTHEM survey carried out by BHP targeting unconformity U-Au-PGE deposits indicated the usefulness of input EM surveys in targeting unconformity uranium deposits under cover. In particular the ability to locate basement conductors related to graphite in fault zones or clay alteration. Part of the BHP survey covers the current EL.

The western covered region of the Murphy Inlier has the potential to host an unconformity type uranium deposit at depth

A list of the ATPs and ELs previously covering area about EL 24841 is provided in Table 2.
Table 2. Previous tenements over the EL 24841 area.

<table>
<thead>
<tr>
<th>Licence</th>
<th>Company</th>
</tr>
</thead>
<tbody>
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<td>ATP 444</td>
<td>MIM</td>
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<tr>
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<td>Carpentaria Exploration Company</td>
</tr>
<tr>
<td>ATP 3401</td>
<td>ESSO Australia</td>
</tr>
<tr>
<td>EL 122</td>
<td>Noranda Australia</td>
</tr>
<tr>
<td>EL 886 &amp; EL 887</td>
<td>T.W. Cawley and R.A. Weston</td>
</tr>
<tr>
<td>EL 1339</td>
<td>AAR Ltd/Otter Exploration “Coolibah” JV</td>
</tr>
<tr>
<td>EL1427</td>
<td>Mines Administration/Otter Exploration “Bowgan Creek” JV</td>
</tr>
<tr>
<td>EL 1253</td>
<td>Mines Administration/Union Oil JV</td>
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<tr>
<td>EL1234</td>
<td>Mines Administration/ESSO Australia JV</td>
</tr>
<tr>
<td>EL 2232</td>
<td>Amoco Minerals</td>
</tr>
<tr>
<td>EL 4392 &amp; 4438</td>
<td>Stockdale</td>
</tr>
<tr>
<td>EL 4352</td>
<td>Ashton Mining</td>
</tr>
<tr>
<td>EL 6836</td>
<td>Carpentaria Exploration Company</td>
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<tr>
<td>EL 7222 &amp; 7223</td>
<td>MIM</td>
</tr>
<tr>
<td>EL 8997, 8998, 9163 &amp; 9660</td>
<td>BHP</td>
</tr>
</tbody>
</table>

7 WORK COMPLETED DURING THE PERIOD

7.1 Summary of Work Done

Work completed during up to 31 July 2007 consisted of;

- A comprehensive review and assessment of previous mineral and diamond exploration work.
- An airborne EM and magnetic survey.
- A mineral assessment and target selection by Douglas Haynes Discovery Pty Ltd comprising:
  - Compilation of public domain geological, geochemical and geophysical data;
  - An interpretation of the geological and structural data for the region;
  - A geophysical and geochemical interpretation of available data, incorporating the airborne EM survey.
  - Selection of potential target areas.

7.2 Assessment of Previous Exploration

A summary of this review is provided above in Section 6 and detailed in Appendix 1. As part of this review the limited drilling in the area was used to map out a rough depth to basement. The results indicate that Proterozoic basement is at a shallow depth to the south of EL 24841 and that the region contains buried Westmoreland Conglomerate and Murphy Metamorphics (See Figure 3). In addition a review of BHP “Bowgan” airborne GEOTHEM survey (1997 openfile report CR97/260 & 97/325) showed that input EM could be used to map conductive units in the Murphy Metamorphics corresponding to graphitic schists. Figure 4 shows the correlation between GEOTHEM Channel 14 peaks and outcropping Murphy Metamorphics (taken off the 1:250,000 sheets) in the area of EL 24694. Graphitic schists have a strong association with unconformity-type uranium deposits in both the Alligator Rivers region, NT and the Athabasca Basin, Canada. In the Athabasca Basin, airborne input EM is regularly used in uranium exploration.
Figure 3. Depth to Proterozoic basement for previous drilling (yellow dots).

Figure 4. BHP GEOTHEM channel 14 data with outcropping Murphy Metamorphics (yellow outline).

7.3 Airborne EM and Magnetic Survey

An airborne EM (HOISTEM) and magnetic survey was carried out over EL 24841 and Buffalo Gold Ltd’s adjacent EL 24694. The survey was flown by GPX and consisted of 1572
line kilometres (~917km over EL 24841), flown on 400m spaced east-west lines. The survey
details and logistics are attached in Appendix 3. The survey data were processed by
GeoDiscovery Ltd Pty in Brisbane. Selective rectified images can be found with the
interpretative layer GIS in Appendix 4. The section data, gridded data, images and location
data are provided on the attached DVD (Appendix 5).

Figure 5. HOISTEM survey location (hatched area).

Interpretation of the input EM and magnetic data located several high amplitude anomalies
related to structures seen in the magnetics (see Figure 6). These anomalies are thought to
represent either mafic dykes or sill complexes. The reduced basement in the Murphy Inlier
here does not appear to exhibit a strong EM signal but it could contain either disseminated
pyrite or graphite and therefore show as a conductive unit. The anomalies were incorporated
in the mineral assessment and target selection presented below in Section 7.4. The large
conductive mass in the NW corner of the survey is thought to be a surficial or shallow flat
lying layer above basement and could be correlated to Cambrian volcanics or sandstones.
7.4 Mineral Assessment and Target Selection

The first part of the mineral assessment involved the compilation of available geological, geochemical and geophysical data. These data included the vector 1:250,000 geological map sheets, NT openfile geochemistry, NT mineral occurrence data and regional NT magnetics, Bouguer gravity and radiometric data. These data were then used to define (i) magnetite-additive and magnetite-depleted alteration zones; (ii) comparably altered faults or joint sets or dykes; (iii) mafic dykes and mafic dyke-sill complexes; (iv) limits of haematite stable coarse grained siliciclastic sedimentary units such as the Westmoreland Conglomerate; (v) the limits of the McArthur River Basin flood basalt units and their contact with the Westmoreland Conglomerate; (vi) the limits of “reduced” fine-grained siliciclastic sediments.
or metasediment units in the Murphy Inlier; and (vii) major high angle faults and their styles. Some emphasis was also placed on defining the granites and felsic volcanic rocks associated with the Nicholson granite complex, and the possible extension of the Cliffdale Volcanics, concealed under cover. Interpretative vector layers used in the assessment are presented in a GIS in Appendix 3.

The results of this work identified six conformity-type uranium targets on the north-western end of the licence (see Figure 7). In addition to the uranium targets, eight high risk Cu-Ni targets, related to mafic dyke or dyke-sill hosted Cu-Ni mineralisation, were also defined using the EM data (see Figure 7). Target descriptions follow:

- **U1** is a large target which extends into Buffalo Gold Ltd’s adjacent EL 24841. The area is thought to be a large section of the Westmoreland-Murphy Inlier unconformity that is cut and offset by southern extensions of the Emu Fault; indicated by NW trending sets of dykes and faults. The target area has corresponding EM anomalies and a moderate uranium radiometric anomaly. The redox state of the basement is not certain.

- **U2** is a small target area to the south of U1 and also extends in to EL 24841. This anomaly is similar to U1 with an inferred section of faulted Westmoreland Conglomerate-Murphy Inlier unconformity displaying high angle NW trending faults. A complex array of dykes and sills occurs in the area, however there may be a thin layer of Cambrian Antrim Plateau Basalts resting on the Westmoreland Conglomerate or directly on the inlier which is giving rise to EM signature.

- **U3** is a small target area on the northern edge of the EL. This is a Westmoreland Conglomerate-Murphy Inlier unconformity target. The area shows NW-trending high-angle faults that likely contain dolerite dykes. The position of unconformity and the redox state of the basement is highly uncertain here.

- **U4** is a long NW trending target in the NW corner of the EL24841. This is a Westmoreland Conglomerate-Murphy Inlier unconformity target associated with a NW set of dykes and high-angle faults that intersect and offset the unconformity. The redox state of basement is not certain. There is a possible granite nearby, with an associated mafic dyke sill complex or contact aureole, of pre Westmoreland Conglomerate age.

- **U5** is a target near the centre of EL24841. This is a Westmoreland Conglomerate-Murphy Inlier unconformity target associated with a NW set of dykes and high-angle faults that intersect and locally offset the unconformity. The redox state of the basement not certain. There may be thin Antrim Plateau Basalt above the Westmoreland Conglomerate here and resting on the Murphy Inlier “basement”, although part of the signature indicating mafic volcanic rocks beneath the Westmoreland Conglomerate may cause such signatures.

- **U6** is situated over a inferred mafic complex in the SE corner of EL24841 and is a Westmoreland Conglomerate-Murphy Inlier unconformity target. There are associated well-defined EM anomalies, which may indicate chlorite-illite alteration and uranium mineralization. Alternatively, these anomalies may be of interest for nickel copper mineralisation.
C1 and C2 correlate to high amplitude EM anomalies and are possibly large dyke-sill complexes of possible Tawallah Group age that correspond to feeder zones for flood basalts in the southern part of the McArthur Basin. There is a possibility that the EM anomalism is caused by heavy mineral layers in a synclinal remnant of the Westmoreland Conglomerate, however the complexity of the magnetic in this area suggests this is not the case.

Target C3 shows an offset high amplitude EM anomaly corresponding to a possible dyke. The dyke is of either Tawallah Group or Antrim Plateau Basalt age (note the Antrim Plateau Basalts display parental picrite magma geochemistry, crustal contamination and Ni-PGE depletion) and could be a feeder zone to either sequence of volcanics. The dyke, however, does not display a complex configuration and has a low magnetic susceptibility thus down playing its potential.

Target C4 is similar to target C3. It has a small moderate amplitude EM anomaly with low magnetite susceptibility (negative feature) corresponding to a small dyke complex. It is possible that the EM anomalism is caused by supergene clay or hypogene illite-chlorite alteration near the dyke.

Target C5 is similar to targets C1 and C2 in that it corresponds to a high amplitude EM anomaly offset from what appears to be a composite dyke-sill complex. However, the magnetic susceptibility is low and the Bouguer gravity signature is poor (although gravity data are coarse). This suggests that the EM signature might be related to chlorite and illite alteration associated with uranium mineralisation. Note this Cu-Ni target corresponds to the southern edge of the uranium target area U1.

Target C6 is within a dyke-sill complex possibly displaying affinities with the small lopolith at Jinchuan, or with the complex composite dyke-sill complex associated with the Noril’sk-Kharaelakh fault; consequent has potential to host a very small Noril’sk deposit analogue. However, magnetic susceptibility is low and the Bouguer Gravity signature is poor, both discouraging features, but the complex is a very well configured feature, with offset, moderate amplitude EM anomalies. The dyke-sill complex here is of likely Tawallah Group age, possibly comprising part of the feeder dykes and sill complex responsible for the southern part of flood basalt province within the McArthur Basin here. Note, that chlorite and illite alteration associated with U mineralization may cause the EM anomalies.

Target C7 displays affinities with the Agua Blanca or Insizwa deposits, but magnetic susceptibility is low, a negative feature. A moderately configured dyke-sill complex, but it is small, with an offset moderate amplitude EM anomaly. Dyke of Tawallah Group or Antrim Plateau Basalt age. Supergene clay or hypogene illite-chlorite alteration near the dyke may cause the EM anomaly.

Target C8 displays possible affinities with the Jinchuan or Insizwa deposits, but magnetic susceptibility is low, a negative feature. The dyke-sill complex here appears to be well configured and is large. The complex is of either Tawallah Group or Antrim Plateau Basalt age.
Figure 7. Target areas (U in yellow and Cu-Ni in blue) with interpreted Murphy Metamorphics (black dashed on orange outline), and mafic dykes (purple dotted lines), mafic complexes (black ‘v’), and hidden granite (purple ‘x’). Image is TMI_HSI (sun angle 50° at 90°).
8 CONCLUSIONS

Results from work during this period have confirmed that the covered western end of the Murphy Inlier is prospective for uranium mineralisation and that previous exploration has not adequately tested this area for concealed uranium deposits. Limited drilling in the area indicates that cover thickness are not great.

An airborne input EM survey has located several EM anomalies in the area that could be related to graphitic schists in the basement faults or possible chlorite-illite alteration zones associated with unconformity uranium mineralisation. In addition the EM survey highlighted several mafic dyke and sills complexes. These complexes could be feeder zones for mid-Proterozoic and early Cambrian flood basalts within the southern McArthur Basin and as such could have potential for mafic hosted Cu-Ni mineralisation.

A detailed mineralisation assessment combining public domain data and information was successful in highlighting favourable mineralisation features such as the extension of the Westmoreland Conglomerate and Murphy Inlier under cover and altered structural zones. Results from this assessment found six main target areas for unconformity-type uranium deposits and eight target areas for possible mafic dyke-sill hosted Cu-Ni deposits. All the target areas are under cover and have not been previously tested.

9 FUTURE WORK

Follow-up work on the uranium targets will involve a detailed in ground radiometric and radon track etch survey on lines over the major structures that intersect the main target areas. This will be followed by air-core drilling sampling of the Proterozoic basement.

The Cu-Ni targets represent “high risk” exploration, so it is planned to drill test, with air-core, the best target (C1) to confirm the potential of this type of mineralisation in the area before developing a more detailed exploration program.
APPENDIX 1. Expenditure statement.
### NORTHERN TERRITORY EXPLORATION EXPENDITURE FOR MINERAL TENEMENT

#### Section 1. Tenement type, number and operation name: (One licence only per form even if combined reporting has been approved)

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**Operation Name (optional)**

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<td>From</td>
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<tr>
<td><strong>To</strong></td>
<td>To</td>
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<td><strong>Covenant for the reporting period:</strong></td>
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<tbody>
<tr>
<td><strong>Author</strong></td>
<td>Darryn Hedger</td>
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<td>Geographic Location</td>
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#### Section 5. Work program for the next twelve months:

**Activities proposed** (please mark with an "X"):

- [ ] Literature review
- [ ] Geological mapping
- [ ] Rock/soil/stream sediment sampling
- [X] Drilling and/or costeasting
- [ ] Airborne geophysics
- [X] Ground geophysics
- [X] Other: Radon Track Etch Survey

**Estimated Cost:** $100,000

#### Section 6. Summary of operations and expenditure:

Please include salaries, wages, consultants fees, field expenses, fuel and transport, administration and overheads under the appropriate headings below. Mark the work done for the appropriate subsections with an "X" or similar, except where indicated. Complete the right-hand columns to indicate the data supplied with the Technical Report.

**Do not include the following as expenditure (if relevant, these may be discussed in Section 7):**

- Insurance
- Company Prospectus
- Rent & Department Fees
- Bond
- Transfer costs
- Title Search
- Legal costs
- Advertising
- Land Access Compensation
- Meetings with Land Councils
- Payments to Traditional Owners
- Fines
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| Ground Exploration Subtotal | $  |

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| Subtotal | $  |

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| Subtotal | $  |

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| Subtotal | $  |

| TOTAL EXPENDITURE | $ 118,480 |
Section 7. Comments on your exploration activities:

Exploration successfully delineated several target zones which will be followed in the next exploration period.

I certify that the information contained herein, is a true statement of the operations carried out and the monies expended on the above mentioned tenement during the period specified as required under the Northern Territory Mining Act and the Regulations thereunder.

[ ] I have attached the Technical Report

1. Name: Darryn Hedger  
   Position: Exploration Manager  
   Signature: 
   Date: 12/9/2007

2. Name:  
   Position:  
   Signature:  
   Date:
APPENDIX 2. Summary of previous exploration.
The first (poorly) recorded work in this area is prospecting by various companies and crude airborne surveys. This resulted in the discovery of a large number of uranium occurrences including the Westmoreland group of deposits to the east of the current tenement. It is likely that most, if not all, significant surface occurrences of radioactive elements in the region were located in this phase.

There is a distinct hiatus between 1963 and 1970, reflecting the fact the immediate post-war demand was primarily for nuclear weapons and this demand was rapidly satisfied, while demand for uranium for use in nuclear power generation did not grow substantially until the late sixties and seventies.

The second wave involved a large number of companies many of whom were also operating in the Pine Creek region of the Northern Territory at a time of many major discoveries. Emphasis was placed on airborne spectrometer (and magnetometer) surveys and in areas of no Proterozoic outcrop, water sampling and reconnaissance drilling. Prospecting also continued. The similarity in geology between this area and the Alligator Rivers region had been recognized although the nature of the uranium deposits in the Alligator Rivers region were still poorly understood. In some cases the target was sandstone-hosted (“roll-front”) uranium, similar to deposits more commonly found in unmetamorphosed Mesozoic and younger rocks.

The airborne radiometric surveys revealed many anomalies that were systematically checked by scintillometer in few cases drilled. Many of these anomalies appear to be related to brecciation, quartz veining (or “silicification”) and iron-metasomatism (“ferruginization) associated with faults in the Nicholson granite and Murphy Metamorphics. None of these anomalies appear to be worthy of further work.

Other companies (including CEC/MIM, BHP, Stockdale & Ashton) have targeted this region for gold, base-metals (sedex) and Kimberlite-hosted diamonds. No significant gold and base-metal discoveries were made. A large number of diamonds were recovered from Ashton’s Cresswell Creek prospect (outside the current tenement area) and substantial drilling completed. This area is now subject to an ERL, and is in any case outside the current tenement. A further three diamonds were recovered in sampling by Stockdale.

A small INPUT survey was flown by Ashton. This is within the area of BHP’s later GEOTEM survey that covers part of the current tenement and provides important information to guide the search for unconformity uranium-gold-PGE.

The potential of the tenement to host an unconformity-type U deposit at depth remains untested.
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**ATP 444 MIM**

**CR56-04**

Summarises work done in 1956. The location of this and several of the subsequent tenements with respect to the Global tenement are shown in figure 1.

Air traverses 1 mile apart were flown in an Auster aircraft for the purpose of aerial reconnaissance and airborne scintillometry. The location of these traverses is not given. Areas for follow-up were located mainly in volcanic rocks (and thus not in the current tenement area) but ground follow-up failed to find anything of interest.

A BMR airborne scintillometer survey coincided with the presence of the MIM field party and BMR made available anomaly locations that were then followed up by MIM staff. On only one of these was a U mineral found, in the Westmoreland conglomerate (but no details, including position were provided). Two Cu occurrences were located during prospecting activities.

**ATP 983 CEC**

**CR63-04**

Summarises work done in 1962. This tenement is very large and much of it lies to the north of the present area of interest and only the “border area” overlaps. The main expenditure in this year appears to have been drilling the HYC prospect and other Pb & Cu occurrences. The portion of the tenement in area of interest was relinquished after one year of prospecting activity, no encouraging signs having been located.

**ATP 3401 ESSO Australia**

**CR73-103**

Esso could find “no record whatsoever” of exploration in this tenement. Their target was vein-type or sandstone-hosted uranium (the “unconformity-type” had not yet been defined). Methods used were:

- Airborne radiometric survey (magnetic data were collected but not processed)
- Carborne scintillometer traverses
- Sampling of drill cuttings (200) and water (34) from water bores
- 47 rock samples

Anomalous U (to 36 ppm) was found in some cuttings. Also elevated Zn (to 740 ppm), W (to 400 ppm) and Cu (to 270 ppm). A combination of 15 water and 10 cuttings samples define an anomalous area extending for 50 miles (about 100 km) in a NE-SW direction. The location of this anomalous zone was not given, however, other than it lies within “the northern boundaries” of the A to P.

Airborne & carborne radiometric surveys did not provide much justification for further work. No follow-up was carried out in the anomalous area.
Previous work on this tenement (which shares a common boundary but does not overlap the current tenement) was carried out by a JV of United Uranium, Geopeko and EZ. In 1972 Newmont and Utah joined the JV and Newmont became the operator. The early work is not documented. Noranda carried out:

- Ground magnetic, radiometric and rock sampling follow-up of four radiometric anomalies identified in a 1970 airborne survey
- Drilling of 7 percussion holes at Anomaly 30 (Fig. 1).

Follow-up of the three of the radiometric anomalies yielded no results of significance. Drilling at Anomaly 30 resulted in intersection of a maximum of 115 ppm uranium in sandy siltstone, siltstone, “shale”, chlorite “shale” and phyllite of the Murphy Metamorphics. Curiously, despite the apparently poor results four MLs were applied for.

El 886 was a small tenement entirely within the area of ESSO’s former AtP 3401. The holders carried out prospecting with a scintillometer. Up to 10 times BG was encountered in the Benmara Beds, and in a gully up to 30 times BG. No visible uranium was found and the tenement abandoned.

EL 887 corresponds to the northern portion of ESSO’s former AtP 3401. Messrs Cawley & Weston bemoaned the fact that ESSO had made an agreement with the owners of Benmara Station preventing them from sampling water bores. As with the previous tenement work appears to have been mainly prospecting with scintillometer and preparation of a geological sketch map. They noted the abundance of black soil, with outcrops of granite and laterite in the SE and NE portions. Radioactivity up 5 times BG was found in the latter, but was not enough to provoke further work.

Three of ten water bores in the area were sampled and returned anomalous U of 23, 43 and 137 ppb (analysis at Zinc Corp, Broken Hill). The remaining seven bores apparently contained saline waters with elevated Mg and H₂S. Despite the anomalous uranium in water bores no further work was carried out and the tenement was relinquished.
Figure 1: ATP 3401 (black outline) & EL122 (red outline). The area of anomalous U in bore water identified by ESSO is unfortunately not defined, but is in the northern portion of the licence.
EL1339 AAR LTD/OTTER JV “Coolibah”

CR1978-38

The tenement covered “Quaternary plains” adjacent to Benmara metamorphics (see also EL1427, below). The program consisted of water sampling to verify previous holders anomalous results (i.e. Esso). The target was roll-front uranium. The previous holders results weren’t reproduced. A number of shallow holes were drilled along roads that failed to intersect even economic uranium, but did confirm the presence of Murphy Metamorphics.

EL1427 MINES ADMINISTRATION/OTTER JV “Bowgan Creek”

CR78-138

The JV carried out:

- More sampling of water from water bores
- Reconnaissance drilling aimed at discovering a sandstone-hosted (“roll-front”) deposit (400m of OHP).

Multiple samples were collected at each bore, one dispatched to ACS of South Australia for determination of U and another to CSIRO in Sydney. Most analyses were below detection limits. Only two were defined as anomalous, with maximum values of 97 and 12 ppb $\text{U}_3\text{O}_8$ (analytical technique not known). Both high values fall within the previously defined anomalous area, although the magnitude of anomaly is less.

Drilling was widely spaced along roads and was apparently of a reconnaissance nature, rather than targetting specific areas. Minor radioactivity was found in CO14, but “additional drilling in this immediate area” failed to find any additional traces. These holes intersected sandstones believed to be Upper Proterozoic in age, lateritised schist of the Murphy Metamorphics, up to 30m of Cenozoic sediments and some possible Mesozoic rocks.

The conclusion was that “the limited nature of the drilling program has meant that this area has not been completely evaluated and the intersection of some radioactivity in a prospective sedimentary sequence warrants a further drilling effort”.

CR80-118

Apparently no exploration took place in 1978 as a suitable drilling contractor was not available. Three stratigraphic holes were drilled in 1979, one aborted after 22m. The two successful holes intersected Nicholson granite, but no elevated uranium.

EL1235 MINES ADMINISTRATION/UNION OIL JV

CR79-009, CR80-143

The following work was carried out:

- Air photo acquisition and geological interpretation by Loxton, Hunting & Associates.
- Airborne radiometric & magnetic survey (5,000 km at 250 spacing and 80m height)
- Analysis of 450 stream sediment samples
- 350 km of radiometric & geological traversing
- Assaying of 68 rock samples
- 500 km of ground radiometric surveys
- Alphameter surveys at Anomalies I, II, III & IV
- 4 successful and 2 aborted diamond holes and 43 percussion holes at Anomaly I
- 26 percussion holes at the other three anomalous sites
Over 40 radiometric anomalies from the airborne and ground surveys were followed up and four deemed significant. These occur at the contact of Murphy Metamorphics and Nicholson Granite. Alphameter surveys revealed “interesting” radon anomalies at each, the most extensive being at Anomaly I.

Anomaly I consists of a zone of high radioactivity located in a 5m wide fault zone, with veins of opaline silica, apparently in a granophyre. Minor torbernite was found in float from this area which assayed 0.74% U. Seven of 31 samples (from within the 400 cps ground spectrometer anomaly) averaged 368 ppm U and 493 ppm Th. The four diamond holes intersected quartz-chlorite rocks faulted against granite, but no uranium mineralization. A staggering 43 percussion holes were similarly disappointing.

Anomaly II occurs in ferruginous quartzite apparently adjacent to granite. Elevated radioactivity extends over a very small area ($5m^2$) although a “significant” radon anomaly was found here. Two OHP holes were completed with totally uninteresting results. Anomalies III and IV appear to be similarly small. Nevertheless 14 OHP holes for 294m were completed at Anomaly III and 8 for 200m at Anomaly IV. The holes frequently intersected hematite-quartz breccia, but no significant uranium although elevated gamma responses were encountered in some holes during logging, often at granite contacts.

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**EL1234 MINES ADMINISTRATION/ESSO AUSTRALIA JV**

**CR79-127, CR80-189, CR80-041**

The tenement was explored under a heads of agreement between Minad, Esso and IOC Petroleum. Esso was operator. The following was carried out:

- Air photo acquisition and geological interpretation by Loxton, Hunting & Associates.
- Airborne (helicopter-borne) radiometric & magnetic survey (1150 km at 200 spacing and 60m height)

Nine uranium anomalies were detected during the radiometric survey, eight of which are associated with the Nicholson Granite. Two were recommended for follow-up: 901 & 3501. The former is defined by counts of 400 (BG 90) in “ferruginized and sericitised granite”, the latter in intensely quartz-veined granite with counts of up to 1000 cps and 105 ppm $U_3O_8$ in rock. Follow-up was recommended on these anomalies.

CR80-041 describes follow-up of anomalies 901/801 and 3501. Anomalies 801 and 901 are on adjacent flight lines and are probably the same anomaly. The anomaly was gridded and ground scintillometer measurements taken. The anomaly is located in sheared and silicified granite and 3 rock samples returned < 100 ppm U. No further work was recommended. Ground scintillometry and rock samples revealed a similar lack of uranium at anomaly 3501.
Figure 2: Tenements 1234 – 1427. The circles are shallow drillholes completed by the Minead joint venture.
The target was sediment-hosted Pb-Zn. It was noted that there had been “no previous exploration over the property”. The tenement is covered by Cambrian and Upper Proterozoic sediments in the main, although outcrops of very iron-rich Lower Proterozoic rocks were noted. Amoco carried out:

- Helicopter supported gravity (36 stations)
- Helicopter supported soil geochemistry (Hg, Pb & Zn)
- Scintillometer measurements (at soil sample sites)
- “Field Checking”

Soil sampling revealed anomalous Pb in the basal Cambrian sediments but no elevated radioactivity. Amoco concluded that “potential remained for U-Au deposits” but that this potential was not great “given the paucity of outcrop and depth of weathering”.

Stockdale undertook a program of stream sediment sampling between 1983 & 1985 on a package of several tenements. ELs 4438 & 4392 abut the current area of interest, and 107 stream sediment and loam samples were collected here. Three diamonds were recovered.

This report discusses work in the area of interest and adjacent EL4439 during 1986 & 1987. Work in this period included fixed wing and helicopter-borne aeromagnetics, and collection of additional stream/loam sampling (115 samples) and 6 rock samples. Sixteen magnetic targets were identified. Three were discounted as non-kimberlitic and 8 subjected to SIROTEM follow-up. Most anomalies are in the northern part of EL4438 and 4392. Possibly kimberlitic chromite was detected at three of the magnetic anomalies. All holes were less than 50m deep. A few meters of core was recovered from some of these holes.

This report covers only EL4438 & 4392 and describes drilling of 16 drillholes in 10 anomalies. No kimberlites were intersected, but mafic rocks in contact with Nicholson Granite.

This tenement covered mainly the Upper Proterozoic sediments to the south of the present tenement. The exploration was subject to a JV between Ashton, Aberfoyle, Australian Diamond Exploration PL and Fibade PL. The target was a kimberlite pipe, but some gold exploration was also conducted. “Numerous diamonds were recovered from the licence area” but a kimberlite source was not located. No signs of gold mineralization were detected. Work carried out included:

- Regional gravel (8) & loam (80) sampling
- Over 650 RAB Drillholes (typically to 30m)
- Bulk gravel sampling
Costeaming
• Airborne INPUT (Geoterrex, N portion of tenement only) 250m line spacing, 60m bird height.
• Airborne magnetic (Austirex) survey
• Daedalus 1268 airborne thematic mapper survey (11 channels)
• 39 BCL stream sediment samples in SE part of tenement
• Over 9 diamond holes (>817m)

Two of the initial regional samples and 7 follow-up contained diamonds, as well as chromites and garnets. The latter, however, were thought to be of non-kimberlite origin. Four magnetic anomalies were subjected to follow-up. BX 1/1 was found to be due to ultrabasic rocks. One diamond drillhole (MD-5) and eleven RAB holes were completed. The thematic mapper generated a large number of spectral anomalies. Seven INPUT anomalies were diamond-drilled. A large number of RAB holes were completed and seven diamond holes at Creswell Creek in the NW part of the tenement. 482 microdiamonds were recovered in this program. The reasons for abandoning this encouraging prospect were not fully explained. Six of the BCL samples returned > 1 ppm Au in five drainages. Follow-up samples failed to “sustain” the original results.
<table>
<thead>
<tr>
<th>Hole ID</th>
<th>Anomaly</th>
<th>Total Depth (m)</th>
<th>Basement Depth (m)</th>
<th>Rocks in basement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD82</td>
<td>IC-17</td>
<td>87.2</td>
<td>73.7</td>
<td>Laminated shale, siltstone &amp; sandstone</td>
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<tr>
<td>MD83</td>
<td>IC-18</td>
<td>90.2</td>
<td>7.0</td>
<td>Mudstone, dolomitic siltstone, sandstone, chert</td>
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<tr>
<td>MD84</td>
<td>IC-15</td>
<td>59.5</td>
<td>6.0</td>
<td>Siltstone, dolomitic siltstone, dolomite &amp; chert</td>
</tr>
<tr>
<td>MD85</td>
<td>IC-20</td>
<td>59.4</td>
<td>11.0</td>
<td>Quartz-biotite-feldspar meta-sediments, granite</td>
</tr>
<tr>
<td>MD86</td>
<td>IC-21</td>
<td>62.5</td>
<td>8.0</td>
<td>Adamellite, microgranite</td>
</tr>
<tr>
<td>MD125</td>
<td>IC-62</td>
<td>63.2</td>
<td>17.5</td>
<td>Micaceous metasediments</td>
</tr>
<tr>
<td>MD126</td>
<td>IC-63</td>
<td>38.0</td>
<td>33.1</td>
<td>Coarse sandstone</td>
</tr>
</tbody>
</table>

Table 1: Summary of basement information from Ashton drilling of INPUT conductors

Figure 4: Tenements 2232-4392. Blue circles are drillholes completed by Stockdale. Ashton’s Cresswell Creek prospect is shown.
EL 6836 CEC “Benmara South”

CR91/354

Work carried out:

- Helicopter-supported BCL stream sediment survey (105 samples, all included analysis for U)
- 5 rock-chip samples

The results of this survey were “disappointing”.

Stockdale made an agreement with CEC such that they could sample the tenement for diamonds. This work was not reported here.

EL 7222 & 7223 MIM “Coolibah & Barkly”

CR93/151 & 94/232

These tenements were thought to enclose “Middle Proterozoic sediments with a veneer of Cenozoic cover”.

- Stream sediment sampling (60 BCL & -200 mesh, with additional 41 follow-up samples). Analysis included uranium and thorium by XRF.
- Ashton aeromagnetic data were reprocessed
- Ashton INPUT data were reprocessed
- 3 lines of moving loop SIROTEM (Solo Geophysics)

The stream sediment survey indicated several drainages with anomalous Au (to 9 ppb) Zn (to 220 ppm) & Cu (to 165 ppm) and Sn (to 460 ppm) but these anomalies could not be reproduced. Anomalies were found within outcrop of the Westmoreland Conglomerate and at its contact with the Nicholson Granite (at Coanjula, Well and 12 Mile Creeks). Only two low-order anomalies (maximum 3ppb Au) occur within the current tenement (Fig. 5).

Reprocessing of the Ashton INPUT data revealed shallow conductive cover spatially related to black soil plains. Several deeper conductors coincident with the projected extension of the Emu fault were thought worthy of follow-up. Three ground EM traverses were completed in 1993 over INPUT conductors, but “no significant bedrock conductors were found”.
Figure 5: CEC/MIM Tenements
CR97/260 & 97/325

This tenement package targeted the Fish River fault zone, considering it to be prospective for base-metal deposits. The report notes that the tenement area has not previously seen “effective base-metal exploration”.

Work carried out included:

- Regional GEOTEM (1862 line km)
- 4km of moving loop EM
- Ground magnetics

The GEOTEM survey partly overlaps the older INPUT survey flown for Ashton Mining (ADE JV). GEOTEM revealed seven anomalies interpreted to be in the South Nicholson Group. Conductive units were noted in the South Nicholson Group (Mullera Formation), Cenozoic cover and Murphy Metamorphics (including a unit with < 20 ohm/m). The latter is of most interest for uranium exploration but was not deemed important by BHP who were not seeking uranium. Anomaly 3 was not in the tenement package and interpreted as graphite in a fault zone.

Moving loop EM at anomaly 1 revealed a resistive layer (415 ohm/m) between 3 and 160m and a highly resistive layer (2500 ohm/m) beneath. At anomaly 2, similarly resistive material was inferred at 245m depth. At anomaly 6, more conductive rocks (1400 ohm/m) were inferred at 60 – 70m depth. Accordingly, no drill-testing was carried out, and the anomalies attributed to conductive rocks within the unprospective South Nicholson Group.

Ground magnetics was carried out over aeromagnetic anomaly BEN3 (Fig. 6) and revealed a possible kimberlite (Fig. 7).

![Figure 6: Airborne magnetic contours of anomaly BEN3 possible kimberlite. The distance between the two crosses is 1.5km.](image-url)
Figure 7: Magnetic profile of possible kimberlite anomaly BEN3.
Figure 8: BHP tenements 8997 – 9660. Outline in gray is extent of GEOTEM survey and stars represent EM anomalies. Purple star is possible kimberlite, red stars are EM anomalies.
Figure 9: Channel 14 of the BHP GEOTEM survey. Brown circles are the approximate location of Minead drillholes. The position of the Cresswell Creek prospect is shown as yellow lines.
APPENDIX 3. HOISTEM survey details and logistics.
HoistEM Airborne Geophysical Survey
Cresswell Downs, Northern Territory.

September 2006
Survey Operations and Logistics Report

For
BUFFALO GOLD LTD

Survey Flown by:

GPX Airborne

GPX Airborne
JOB NUMBER 2238
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SURVEY SUMMARY

Client: Buffalo Gold Ltd.
Job Number: 2238
Survey Area: Cresswell Downs, Northern Territory.
Data Processing Base: Cresswell Downs, Northern Territory.

Mobilisation 19th September 2006
Production 20th – 23rd September 2006
Demobilisation 23rd September 2006

Line km surveyed: Cresswell Downs, NT 1,572.1 kms

Survey Crew: Mike Barrett,
Raphael Fisher,
Bob Blizzard
Joe Kita
Dale Bourke (Pilot)

In September 2006, GPX Airborne was contracted by Buffalo Gold Ltd to perform a HoistEM survey in the Cresswell Downs area, NT. The job was flown between the 20th and 23rd of September 2006.

During the survey the crew consisted of Mike Barrett, Joe Kita, Bob Blizzard and Raphael Fisher. The pilot was Dale Bourke. The crew stayed at a fly camp set up near the base station within the survey area.
Survey Area Map

Overview

BUFFALO GOLD
PROPOSED HELI-TEM SURVEY PLAN
GDA94 MGA53
30th May 2006

Scale 1:100000

GPX Airborne Pty Ltd
11 Whitestout Street,
Adelaide, Western Australia. +61 8 8374 8111
GDA94 / Map Grid of Australia 1972
HoistEM System Specifications

**Transmitter**

- **Waveform** – 25% duty cycle square wave
- **Pulse on Time** - 5 ms (inclusive of 1ms cosine ramp on)
- **Pulse off Time** - 15 ms
- **Pulse Current** - 320 Amps
- **Switch on Ramp** - 1 ms
- **Switch off Ramp** - 40 µs
- **Tx Loop Area** - ~340 m²
- **Tx NIA** – 108,800
- **Tx Frequency** - 25 Hz

**Receiver**

- **A-D Circuitry** - 20 bit
- **Sample Time** - 0 - 14 ms
- **Sampling** - 124 Linear channels

(12 channels from 54 microsecs after switchoff-25 microsecs wide
Then -112 channels to 13 milliseconds-113 microsecs wide.

**Receiver Coil**

- **Effective NA** - 3382 Square Metres
- **Bandwidth** – 45,000 Hz
Geometry.

Transmitter loop is towed 30 m below helicopter- Receiver coil is located at centre of Tx loop.

Transmitter / Receiver at nominal 35 m terrain clearance.

Helicopter survey speed is between 35 and 45 knots.

Along line sample interval is between 8 and 10 metres
EM Data Channel Specifications

21 Channel Sampling Scheme

<table>
<thead>
<tr>
<th>Begin Time</th>
<th>End Time</th>
<th>Centre Time</th>
<th>Width Microsecs</th>
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<th>Original Start window</th>
<th>Original End window</th>
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<td>1904.2</td>
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<td>115</td>
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</tr>
</tbody>
</table>

NB: time 0 is at the start of the switch off ramp
Magnetic Data Specifications
The helicopter was equipped with a bird-mounted Geometrics G 822A Cesium vapor, optically pumped magnetometer continuously sampling at 1200 Hz. The instrument has a sensitivity of 0.001nT, with a sensor noise level of less than 0.1nT.

The magnetic readings are resampled to 50Hz with each sample containing an array of 24 readings. Adjacent readings are summed to minimise bias from the EM transmissions to produce the 25Hz magnetic array data. The late time array positions are averaged to create the magnetic response.

The time-synchronized ground magnetic field data was digitally recorded at a 5.0 sec interval with a Geometrics magnetometer to an accuracy of better than 0.1nT.

Base Magnetometer
Type: Geometrics G856 Magnetometer.
Base Location 1: 665641 E 8026690 N (WGS84, Zone 53)
Base Location 2: 665647 E 8026701 N (WGS84, Zone 53)
DATA PROCESSING SUMMARY
The following processes were carried out at the field processing office:

- Spline removal of birdswing
- Negative decays paired and reversed
- Filtering and correction of laser altimeter
- Data is splined to a uniform sample spacing
- Butterworth filter applied to each channel
- Preliminary gridding and data verification

Final EM Processing
Software used for processing at the GPX Perth office:

- Geosoft
- EmaxAIR by Fullagar Geophysics
- ChrisDBF

System response obtained from high level flights is removed from the data. CDIs are generated using EmaxAIR, and depth slice data is interpolated from the Emax output using in-house software. Final plots are created in Geosoft .MAP format, and include CDIs that are masked to the first and last depth solution at each station.

Magnetic Data processing.
The aircrafts magnetic data was corrected for diurnal and the mean diurnal value (49259 nT) added back to the channel. Parallax was applied, followed by the IGRF correction, the mean IGRF value (49323 nT) being added back to data. Micro levelling (± 2nT) were performed on the data.

Digital Elevation Model
The laser altimeter data, plus a constant of 30, was subtracted from the GPS height to give a digital elevation model which represents height above the WGS84 spheroid. This is recorded in channel ‘DEM’. This data was then mean levelled with the SRTM (Satellite Radar Topography Mission, NASA) to remove any levelling.
Final CD Contents

\images
GeoTiff format images of all depth slices, first, minimum, maximum and last conductivity, digital elevation and magnetic data.

\grids
Conductivity depth slices with name convention of dnnn.grd where nnn is the depth of the conductivity slice, grids are in Geosoft GRD format. ERMapper format grids have also been provided, with a ERM_Dnnn.ers naming convention.

Final Magnetic grid: ERM_Magnetics.ers
Final Magnetic Grid + 1st Vertical Derivative: ERM_Magnetics_1VD.ers
Final Digital Terrain (level with SRTM data): ERM_DEM.ers (WGS84 spheroid)

grids\cdi_grids
Geosoft format files of the CDI grids.
**Located data**

**TEM.LDT**

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<thead>
<tr>
<th>Field</th>
<th>Description</th>
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<tbody>
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<td>Line number</td>
</tr>
<tr>
<td>Fiducial</td>
<td>Fiducial number as displayed on the CDI sections.</td>
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<tr>
<td>East</td>
<td>Easting (GDA94 MGA53)(metres)</td>
</tr>
<tr>
<td>North</td>
<td>Northing (GDA94 MGA53)(metres)</td>
</tr>
<tr>
<td>Heli_Z</td>
<td>GPS altitude of helicopter (metres)</td>
</tr>
<tr>
<td>TX_Laser</td>
<td>Height of the laser altimeter on the hoist (metres)</td>
</tr>
<tr>
<td>DEMF</td>
<td>Levelled Digital Elevation Model, WGS84 (metres)</td>
</tr>
<tr>
<td>Current</td>
<td>Transmitter current (amps)</td>
</tr>
<tr>
<td>Ch[*]</td>
<td>EM response, channels 1-21 (uV)</td>
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<td>MagF</td>
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**CDI.LDT**

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<td>Easting (GDA94 MGA53)(metres)</td>
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<tr>
<td>North</td>
<td>Northing (GDA94 MGA53)(metres)</td>
</tr>
<tr>
<td>Distance</td>
<td>Distance along line (metres)</td>
</tr>
<tr>
<td>Depth</td>
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<tr>
<td>Conductivity</td>
<td>Conductivity (mS/m)</td>
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<td>RL</td>
<td>GPS depth (WGS84)(metres)</td>
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**DEPTHSLICE.LDT**

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<td>Line number</td>
</tr>
<tr>
<td>East</td>
<td>Easting (GDA94 MGA53)(metres)</td>
</tr>
<tr>
<td>North</td>
<td>Northing (GDA94 MGA53)(metres)</td>
</tr>
<tr>
<td>Distance</td>
<td>Distance along line (metres)</td>
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<tr>
<td>RL</td>
<td>GPS depth (WGS84)(metres)</td>
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<tr>
<td>[30-150]</td>
<td>Conductivity at specified depth (mS/m)</td>
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</tbody>
</table>
COND_SUMMARY.LDT

Line: Line number
East: Easting (GDA94 MGA53)(metres)
North: Northing (GDA94 MGA53)(metres)
Firstcond: First recorded conductivity in a decay (mS/m)
Maxcond: Maximum recorded conductivity in a decay (mS/m)
Lastcond: Last recorded conductivity in a decay (mS/m)
Mincond: Minimum recorded conductivity in a decay (mS/m)

MAGNETICS.LDT (25Hz data)

Line: Line Number
SPM: Seconds past midnight.
East: Easting (GDA94 MGA53)(metres)
North: Northing (GDA94 MGA53)(metres)
Rawmag: Raw magnetics channel
Diurnal: Diurnal data
PreMag: Diurnal corrected.
IGRF: Calculated IGRF value for each point.
MagF: Final magnetics channel (micro - levelling applied)
GPS_Z: GPS altitude of helicopter (metres)
Clearance: Ground clearance of the Magnetic Sensor.

Each data type is also accompanied with a similar Geosoft database.

\sections
Linear & logarithmic profiles, and conductivity depth images for each line. In Geosoft .MAP format (viewable with the free interface at http://www.geosoft.com ).

\sections\Images
Linear & logarithmic profiles, and conductivity depth images for each line. In PNG (Portable Network Graphics) format.
 IMAGES

60m Depthslice
Total Magnetic Intensity
CONTRACTOR INFORMATION

GPX Airborne
A.B.N. 74 094 570 028
Locked Bag 3, Applecross,
Western Australia. 6153
Telephone:  (08) 9316 8111
Fax:          (08) 9316 8033
Web:  www.gpx.com.au