ANNUAL EXPLORATION REPORT

EL23431

“MT BONNIE WEST”

YEAR ENDING 19 December 2009

Pine Creek 1:250,000 SD5208
Pine Creek 1:100,000 5270

Distribution:-

1. DPIFM Darwin NT
2. GBS Gold Australia Perth
3. Burnside Operations P/L Brocks Creek
4. Union Reefs, Pine Creek

Report No: PC/BJV/09-53

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SUMMARY

EL 23431 is one of the significant tenements within Crocodile Gold Australia portfolio which is located about 140km SE of Darwin, NT and 14 km SE of Brocks Creek. It was part of the Burnside Joint Venture, managed by Burnside Operations P/L comprising Territory Goldfields NL and Buffalo Creek Mines NL. The latter were subsidiaries of Northern Gold NL which was subsequently taken over by GBS Gold Australia Pty Ltd. On 15 September 2008, GBS Gold Australia went into voluntary administration and all assets held by the company were liquidated. Crocodile Gold Australia purchased all assets including EL 23431 on 9 November 2009 and commenced mining and exploration activities in the region.

The tenement comprises a suite of meta-sedimentary rocks belonging to the Palaeoproterozoic South Alligator Group. The Group is part of the Pine Creek Orogen sequence and is contiguous with the base metal and gold mineralised localities of Mt Bonnie and Golden Dyke. The Hayes Creek Fault strikes north east through the centre of the prospect and is important in the localisation of uranium and gold mineralisation.

During reporting period, a dedicated exploration program was undertaken to assess the full potential of uranium mineralisation at Thunderball, discovered in previous exploration program. This included geological mapping, drilling and high resolution geophysical survey over the project area. Down hole logging and assaying of drill chip samples confirmed the presence of uranium mineralisation which is confined to carbonaceous siltstone and tuffaceous units of the Mt Bonnie and Gerowie Tuff.

Exploration at Thunderball prospect has identified a high grade uranium deposit which requires further exploration and evaluation. In the coming year, exploration activities will include RC/diamond drilling, geological studies, geological modelling and geophysical modelling and interpretation.
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1. INTRODUCTION

Significant exploration activity has been carried out over EL 23431 for the last three years, which lead to the discovery of uranium mineralisation in the project area. In this report exploration activity carried out during the year ending 19 December 2009 is presented.

2. TENURE DETAILS

EL 23431 was granted on 20 December 2002 and expires on 19 December 2008. It comprises four blocks that cover approximately 12.88 km². Several pre-existing mining tenements along the Sandy Creek trend and at Mt Bonnie reduce the effective area of the EL. Some are owned by the joint venture and others are held by unrelated parties.

In September 2005, Buffalo Creek Mines P/L sold its 50% stake to Northern Gold NL. In turn Northern Gold was subject to take over by GBS Gold Australia P/L. This constituted a consolidation of titles in the Burnside region under one owner – GBS Gold Australia P/L. Under a farm-out agreement between GBS Gold Australia and Element 92/Thundelarra Exploration Pty Ltd later, the later acquired exclusive rights to prospect and explore for uranium within the tenement in September 2007. On 15 September 2008, GBS Gold Australia went into voluntary receivership and all assets were liquidated. In November 2009, Crocodile Gold Australia purchased all assets including EL 23431 held by GBS Gold Australia.

LOCATION AND ACCESS

EL 23431 is situated about 140 km SSE of Darwin NT and 14 km SE of Brocks Creek siding on the Darwin-Alice Springs railway (Figure 1). Access to the tenement is via the Stuart Highway, thence north via the Grove Hill and Mt Bonnie unsealed road that passes through the tenement.

The tenement falls on the Pine Creek 1:250,000 sheet and on the Pine Creek 1:100,000 sheets. The tenement also is within the Douglas Pastoral Lease. Outcrop of Pine Creek orogenic sequence occurs through much of the tenement and this area comprises undulating hills and ridges of low to moderate relief. Ephemeral creek systems have aggressively dissected the
Figure 1: EL 23431 Tenement Location with Thunderball Uranium prospect
softer units locally making access complex and difficult except on established tracks. In the
north west of the tenement alluvial flats and lower rises dominate.

3. GEOLOGICAL SETTING

4.1 Regional Geology
EL 23431 is situated within the Pine Creek Orogen, a tightly folded sequence of
Palaeoproterozoic rocks, 10 km to 14 km in thickness, laid down on a rifted granitic Archaean
basement during the interval ~2.2-1.87Ga. The sequence is dominated by pelitic and psammitic
(continental shelf shallow marine) sediments with minor inter-layered tuff units. Pre-orogenic
mafic sills of the Zamu Dolerite event (~1.87Ga) intruded the lower formations of the South
Alligator Group and part of the Mt Partridge Group.

During the Top End Orogeny (Nimbuwah Event ~1.87-1.85Ga) the sequence was tightly folded
and pervasively altered with metamorphic grade averaging greenschist facies to phyllite. The
Cullen intrusive event introduced a suite of fractionated calc-alkaline granitic batholiths into the
sequence in the period ~1.84-1.80Ga. These high temperature I-type intrusives induced strong
contact metamorphic aureoles ranging up to (garnet) amphibolite facies, and created more
extensive biotite and cordierite-andalusite hornfels facies.

Open-folded Meso- and Neoproterozoic clastic rocks and volcanics have an unconformable
relationship to the older sequences. Flat lying Cambro-Ordovician sandstone and limestone of
the Daly River Basin along with hill-cappings of Mesozoic arenites overlie the folded basement.

Cainozoic sediments and proto-laterite overlie parts of the Pine Creek Orogen lithologies.
Recent scree deposits occupy the lower hill slopes while fluvialite sands, gravels and red and
black soil deposits mask the river flood plain areas.

3.2 Local Geology
Local geology of the project area is shown in Figure 2. EL 23431 straddles the Hayes Creek
Fault, a major north east striking feature that has dislocated rocks of the South Alligator and
Figure 2: Geological Setting of EL 23431
Finniss River Groups. The fault also has a spatial association with gold deposits.

The **south eastern domain** comprises an open folded sequence of Koolpin Formation mudstones, siltstones and cherty ironstones; Gerowie Tuff comprising alternations of cherty tuff and silt-greywacke, and Mt Bonnie Formation siltstone, mudstone, greywacke and chert horizons. All three formations have been invaded by the Zamu Dolerite event, usually as concordant sills of variable thickness and frequency. The domain is characterised by a dome and basin fold style and is reasonably well exposed. Fold limbs adjacent to the Hayes Creek Fault have been aligned with it. This suggests that the fault represents a failed anticline with south east side up in the manner of a reverse fault. The metamorphic grade of the sequence is biotite (garnet) hornfels superimposed on greenschist facies. Within the Koolpin Formation horizons of tourmalinite have been described. Other units have been converted to calc-silicate amphibole horizons.

The **north western** domain includes Gerowie Tuff, Mt Bonnie Formation plus the conformably overlying Burrell Creek Formation of the Finniss River Group (Figure 2). The latter is dominated by lithic greywacke and siltstone packages and does not seem to have been included in the Zamu Dolerite intrusive event. The formations are aligned north-easterly, parallel to the Hayes Creek Fault, with the oldest units outcropping adjacent to it. The interpretation of this domain differs somewhat from the AGSO mapping and ground traverses are required to resolve any differences. Exposure is of lesser quality in the NW domain.

**5.0 PREVIOUS EXPLORATION**

Work specific to EL23431 is somewhat scarce, though it is certain that regional stream sediment sampling for gold and base metals, plus geological mapping has been carried out by several exploration companies. It is likely that relevant data exists in the mass of technical information inherited from Dominion Mining NL located at the Brocks Creek office library, though sorting and cataloguing this hard copy material is still only at an early stage.

There is considerable detail of work carried out in tenements adjacent to the EL and this has been described in other Burnside JV annual reports. (Mt Bonnie, Iron Blow, Golden Dyke, Sandy Creek Davies No.1 etc.) The bulk of gold production in the vicinity of the tenement appears to have been alluvial in style, concentrated from dispersed faults and fractures in the bedrock.
The Golden Dyke/Sandy Creek data has relevance to EL23431 and was reproduced in full in the 2003 annual report. The Golden Dyke data will not be included this year.

The Sandy Creek area, central to and excised from the EL, was explored by Geopeko in 1985. This region was seen to contain some of the most concentrated and extensive alluvial diggings in the Pine Creek Orogen.

Initial bulldozer costeanning was completed over old basement workings for 700 m, in the Sandy Creek area. The costeans were mapped, and approximately 170 rock chip samples were collected. The results indicated spotty gold distribution in quartz veins as values ranged from 60 grams of coarse gold, doliied from less than 20kg of quartz, to less than 1 g/t Au in the same vein (Nicholson, 1986a).

Further work at Sandy Creek consisted of an area, approximately 30m by 130m, being stripped to bedrock. The quartz veins were mapped and 23 samples were collected. No significant assays were returned. Several additional areas were scraped back to bedrock, approximately 0.3m in depth, identifying a zone 125 m long by 10m wide, with quartz veins assaying to 6.0 g/t Au.

During March 1987, Dominion Gold Operations Pty. Ltd. collected 15 aggregate rock chip samples from the northern part of Sandy Creek (MCN 632).

Samples were collected from discontinuous, poorly exposed and brecciated, quartz veins, 50cm to 2m in width, around the pits. The peak assays returned ranged from 2.1 to 6.4 g/t Au. The samples of gossanous, BIF reefs, on the ridge further south returned values of 0.04 to 0.45 g/t Au (Shepherd, 1987).

During 2006-07, a structural look at the total magnetic intensity of EL 24341 was undertaken as well the possibility of wether further geophysical work such as EM is warranted over the landholding and incorporating both Mt Bonnie and Iron Blow to the north. Of particular interest is the large anticlinal fold in the centre of the tenement and its northern extensions and the eastern limb which hosts other base metal occurrences such as Heatley’s.

During 2008 exploration program, uranium anomaly detected in previous radiometric survey was subjected to geological mapping, ground radiometric survey and drilling (Bajwah and Mees, 2008). On ground exploration commenced with mapping and checking of airborne radiometric anomaly (named Thunderball Prospect) including several lesser anomalies with reconnaissance
scintillometer survey and float sampling. Thunderball prospect was mapped in detail. This mapping shows the Thunderball Prospect lies close to the core of a moderately NNW plunging anticline in the Mt Bonnie Formation meta-sediments (greywacke, shale, siltstone). The entire area of the Thunderball airborne radiometric anomaly was covered by a ground Scintillometer survey at nominal 30m by 5m spacings. The 8.2 line km survey was carried out using an Exploranium GR135 Spectrometer taking readings at 3 second intervals in Total Count search mode, synchronised with a Garmin GPS 60csx.

An RC drilling program was carried out to test the main part of the Thunderball anomaly. A total of 7 holes for 724m were drilled. Most holes intersected anomalous radioactivity as measured with a spectrometer. Two holes intersected zones of visible uranium minerals (fine disseminated uraninite/pitchblende and unidentified yellow-orange secondary uranium minerals). RC holes were sampled in 3m composites, except where scintellometer readings indicated anomalous radioactivity.

**6.0 EXPLORATION YEAR ENDING 19 DECEMBER 2009**

During the year under review exploration activity continued apart from GBS Gold Australia being under voluntary administration. Exploration activity was carried out by JV partner Thundelarra Exploration Pty Ltd. During 2009, activities focused on further exploration of Thunderball uranium prospect, discovered in the south-western part of EL 23431. The main activities were Geological mapping, Drilling, Bore Hole logging and high resolution airborne Geophysical Survey.

**Geological Mapping**

Figure 1 shows approximate area of uranium mineralisation delineated, so far, at Thunderball prospect. Mapping of the project area shows that the mineralisation lies close to the core of a moderately NNW plunging anticline in the Mt Bonnie Formation meta-sediments (greywacke, shale, siltstone). The actual core of the anticline, hosting a possibly stratiform zone of elevated radioactivity consists of inter-bedded siltstones and tuffs, and may be part of the Mt Bonnie and Gerowie Tuff. Higher grade mineralisation at Thunderball may be related to late-stage re-
mobilisation of uranium from a higher elevated background stratigraphic horizon into dilational
structures. However, NW-trending Hays Creek may also have implication for primary uranium mineralisation. The later stage structures hosting uranium mineralisation may have been influenced by pre-existing structures, and it is possible that high grade uranium mineralisation forms plunging shoots controlled partly by the anticlinal fold axis and smaller parasitic folds.

**Drilling**

Three consecutive drilling programs were carried out at Thunderball Prospect on EL23431. It comprises 12 RC drill holes for 1995 meters and 10 diamond drill holes for 1850 metres. Some of the drill hole locations are given in Figure 3, whereas all data (drilling, assay) are given in Appendix 1.

Significant uranium intercepts have been returned from a number of drill holes (Table 1). Diamond drill hole TPCDD006 returned 3.1 m at 2 447 ppm U₃O₈ from a depth of 96 m including 0.5 m at 8 992 ppm U₃O₈ (20lb/t U₃O₈). Significant concentration of U₃O₈ was also returned from TPCRC011 (1 m at 3 151 ppm U₃O₈). TPCRC019 was drilled in August 2009 which returned 15 metres at 1.5%, including 1 metre at 20.3% U₃O₈ (Table 1). Another very high mineralisation intercept was recorded in TPCDD026 which gave a combined intercept of 4.6 metres at 6.8% U₃O₈; it also contained an intercept of 1 metre at 14.6% U₃O₈ (148 – 149 metre).

Northern part of the Thunderball prospect has delivered the best drilling result so far. The high grade uranium mineralisation appears to have continuity and is interpreted to be plunging to the north at about 40° below horizon. The area of mineralisation remains open at depth. Further drilling is planned to test the full potential of uranium mineralisation at Thunderball. Low grade uranium mineralisation from the surface grades into high grade mineralisation which is generally confined to a well developed shear zone developed within carbonaceous pelites of the Mt Bonnie Formation. It contains primary minerals such as uraninite/pitchblende. RC drilling has also met with success where drill hole TPCRC008 intercepted 5 m at 7 600 ppm (17 lb/t) at a depth of 120 m, including 1 m interval at 3.1% U₃O₈ (68 lb/t U₃O₈). Another drill hole (TPCRC010) gave the widest intercept of 11 m at 12 00 ppm.

Mineralisation at Thunderball appears to be shear hosted and consists of massive veins and disseminations of uraninite (pitchblende). The mineralised zone plunges to the north at
Figure 3: Drill hole Location, Thunderball Uranium Prospect
Table 1: Drill hole Assay Summary on Thunderball Uranium Prospect (EL 23431)

<table>
<thead>
<tr>
<th>Hole No</th>
<th>Easting</th>
<th>Northing</th>
<th>From-To</th>
<th>Interval</th>
<th>$\text{U}_3\text{O}_8$ (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPCDD006</td>
<td>772689</td>
<td>8 501 420</td>
<td>95.9-99.0 m</td>
<td>3.1 m</td>
<td>2 447</td>
</tr>
<tr>
<td>TPCDD006</td>
<td>772689</td>
<td>8 501 420</td>
<td>96.3-96.8 m</td>
<td>0.5 m</td>
<td>8 992</td>
</tr>
<tr>
<td>TPCRC008</td>
<td>772 711</td>
<td>8 501 462</td>
<td>120.0-125.0 m</td>
<td>5.0 m</td>
<td>76 00</td>
</tr>
<tr>
<td>TPCRC008</td>
<td>772 711</td>
<td>8 501 462</td>
<td>122.0-123.0 m</td>
<td>1.0 m</td>
<td>3.1%</td>
</tr>
<tr>
<td>TPCRC008</td>
<td>772 711</td>
<td>8 501 462</td>
<td>144.0-145.0 m</td>
<td>1.0 m</td>
<td>791</td>
</tr>
<tr>
<td>TPCRC009</td>
<td>272 712</td>
<td>8 501 463</td>
<td>128.0-129.0 m</td>
<td>1.0 m</td>
<td>962</td>
</tr>
<tr>
<td>TPCRC009</td>
<td>272 712</td>
<td>8 501 463</td>
<td>132.0-133.0 m</td>
<td>1.0 m</td>
<td>885</td>
</tr>
<tr>
<td>TPCRC010</td>
<td>772 710</td>
<td>8 501 463</td>
<td>119.0-130.0 m</td>
<td>11.0 m</td>
<td>1 200</td>
</tr>
<tr>
<td>TPCRC010</td>
<td>772 710</td>
<td>8 501 463</td>
<td>119.0-121.0 m</td>
<td>2.0 m</td>
<td>2 962</td>
</tr>
<tr>
<td>TPCRC011</td>
<td>772 724</td>
<td>8 501 485</td>
<td>146.0-155.0 m</td>
<td>9.0 m</td>
<td>906</td>
</tr>
<tr>
<td>TPCRC011</td>
<td>772 724</td>
<td>8 501 485</td>
<td>148.0-149.0 m</td>
<td>1.0 m</td>
<td>3 151</td>
</tr>
<tr>
<td>TPCRC019</td>
<td>772 721</td>
<td>8 501 486</td>
<td>139-154 m</td>
<td>15 m</td>
<td>1.5%</td>
</tr>
<tr>
<td>TPCRC019</td>
<td>772 721</td>
<td>8 501 486</td>
<td>139-140 m</td>
<td>1 m</td>
<td>20.3%</td>
</tr>
<tr>
<td>TPCDD026</td>
<td>772776</td>
<td>8 501543</td>
<td>148-149</td>
<td>1 m</td>
<td>14.6%</td>
</tr>
</tbody>
</table>
approximately 40° below horizontal and remains open down plunge. A number of holes have intersected a second, parallel zone of mineralisation at shallower depths. Although of lesser grade, this upper zone displays signs of strengthening towards the north, consistent with the primary lower zone of mineralisation.

RC samples were collected at metre intervals though the anomalous radioactive zones and split through a 3 tier riffle splitter to 2-3kg sample weight. Diamond core was half-cored, with samples taken at regular metre intervals, or less based on observed geological contacts, throughout the radioactive zones.

Samples were submitted to Northern Territory Environmental Laboratories in Darwin for analysis, with some check samples sent to Amdel of Adelaide for verification.

Analysis by NTEL involved sample preparation by crushing and riffle splitting the entire sample to <6mm, and pulverising a 1kg split. Analysis used ICPMS after total acid digestion. Elements analysed with their respective detection limits were: Ag(<1ppm), As (<10ppm), Bi(<1ppm), Co(<2ppm), Cu(<5ppm), Ni(<5ppm), Pb(<2ppm), Th(<1ppm), U(<5ppm), V(<10ppm) and Zn(<10ppm). Some samples were analysed for Au, Pt and Pd. These were assayed by fire-assay of a 25g charge to a 1ppb detection limit.

Bore Hole Logging
Some 18 RC holes (this includes some drilled the previous period) and 2 Diamond holes were down-hole logged for gamma radiation and magnetic deviation. Several holes were logged for conductivity/resistivity and had optical imaging work carried out. All the down-hole logging was carried out by Borehole Wireline Services and data are given in Appendix 1.

In general, the gamma logging confirmed the assayed intervals. The optical imaging (Figure 4 in Appendix 1) proved to be extremely useful in RC holes as it allows the recovery of high quality structural data from RC holes, and allows some stratigraphic correlation between adjacent holes. Optical imaging proved to be poor in the Diamond drill holes due to turbidity caused by drilling additives.

Geophysical Survey

Minor ground radiometric prospecting was carried out on EL23431 during geological mapping done in the year in review. No grid ground-radiometric surveys were carried out during this period.
Bulk of geophysical program covered three airborne surveys which were commissioned by Thundelarra Exploration over the area of EL 23431.

The first of these was airborne Tempest EM where Thundelarra participated in the Geoscience Australia Rum Jungle Survey by funding 330m infill lines over part of EL 23431. A total of 32.4km of Tempest EM were flown over EL 23431 by Fugro Airborne Surveys Pty Ltd. The digital data pertaining to this survey was recently submitted to the Mines Department as an addendum to the Annual Report for EL 25553.

The second survey was a trial VTEM survey over part of EL 23431. A total of 11km of VTEM were flown on 7 variably spaced (100m-300m) lines by Geotech Ltd.

The final survey was a combined high resolution airborne magnetic and radiometric survey which included all of EL 23431. Approximately 520 line km were flown at 25m spacing by Thomson Aviation.

The results of all of the above surveys did not become available until late in the reporting period so that only preliminary assessment and processing of the data has been carried out.

This exploration activity costed $715 695.00 and details are given in Appendix 2.

7. FORWARD EXPLORATION PROGRAM 2010

Exploration at Thunderball prospect has identified a high grade uranium deposit which requires further exploration and evaluation. In the coming year, exploration activities will include RC/diamond drilling, geological studies, geological modelling and geophysical modelling and interpretation.

A minimum budget of $30000 has been set for the 2010 reporting period.

8. REFERENCES


