

# ELEMENT 92 PTY LTD

(ABN 82 119 094 423)

(Wholly Owned Subsidiary of Thundelarra Exploration Ltd)

## **ANNUAL COMBINED REPORT (GR205/11)**

### **FOR**

### **EL25379 (DOWLING) AND EL27363 (JIGSAW)**

### **HAYES CREEK PROJECT, NORTHERN TERRITORY**

### **FOR THE PERIOD**

### **12 JANUARY 2012 TO 11 JANUARY 2013**

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Target: Uranium, Gold

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## 1.0 SUMMARY

Exploration Licences (EL) 25379 and 27363 form part of Element 92's Hayes Creek Project and are located about 150 km SE of Darwin and about 55 km north of Pine Creek in the Northern Territory. These ELs were granted combined reporting status (GR205/11) in 2011, and this is second Combined Annual Report, for the year ending on 11 March 2013.

The project area 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 Achaean basement during the interval ~2.2-1.87 Ma. During the Top End Orogeny (1870-1800 Ma), the sequence was tightly folded and pervasively altered with metamorphic grade averaging greenschist facies to phyllite. The project area is underlain by the rocks of Finniss River Group and South Alligator Group. Constituent lithologies are interbedded shale, slate, phyllite, siltstone, greywacke and rare volcanolithic pebble conglomerate, with minor beds of chert and tuff. An important feature is the Hayes Creek Fault system, located SE of the project area, which appears to be related to recently discovered uranium and gold mineralisation.

In recent periods, Thundelarra Exploration Pty Ltd undertook detailed geological and structural mapping of the project area. Recently flown high resolution geophysical data were interpreted in order to understand better subsurface geology that also helped in structural interpretation. This involved incorporation of remote sensing imagery, high resolution geophysical data, photo-geological interpretation and mapping structural setting of the project area.

During compilation of data for these titles, it was discovered that 9 drill holes completed in 2010 had not yet been reported to the Department for Mines and Energy NT. These data are included in this report. These holes were part of a 26 hole programme within the Mount Osborne Prospect (falls within EL23509 and EL27363) completed in June, July and October 2010. The results from the work were discouraging and it was concluded that the Bella Rose - Mount Osborne trend is characterised by a series of very patchy uranium occurrences within a broad structural corridor. It seems likely that these occurrences are due to localised upgrading of mineralisation at certain elevations due to weathering and water -table movements, rather than the existence of structurally-controlled primary mineralisation.

In the period under review, no on-ground works were completed. Office-based work focused on a continuing review of interpretations derived from geological, geophysical and remote-sensing data in previous reporting periods. This has resulted in examination of a magnetically-anomalous body in the nose of a NNE plunging synform which is either a parasitic antiform and/or high-angle reverse fault with associated pyrrhotite alteration (Rankin, 2011). Although lying outside the GR204 title area, the NNE trend apparently extends into EL25379. Following initial work to verify the existence, nature and prospectivity of the structure in EL23509, on-ground works will target the feature in EL25379.

## 2.0 INTRODUCTION

Exploration Licences (EL) 25379 and 27363 form part of Element 92's Hayes Creek Project (**Map 1**). The Project area includes some of the most prospective parts of the Pine Creek Orogen (PCO), with a number of mineral commodities such as gold, uranium, iron and base metals reported. These ELs were granted combined reporting status (GR205/11) in 2011, and this is the second Combined Annual Report, for the year ending on 11 January 2013.

ELs 25379 and 27363 are located about 150 km SE of Darwin and about 55 km north of Pine Creek in the Northern Territory (**Map 2**). The project area can be reached from Darwin via Stuart Highway for about 140 km and then turning on the Fountain Head Road. A track leads off the Fountain Head Road less than 1 km towards SE, and it enters into the project area. Alternatively, it can be approached by a track coming of the Grove Hill Road and then via station tracks.

Mount Osborne is located only about 0.5 km NE from the tenement boundary. Hayes Creek is located about 5 km SW of the titles. Brocks Creek Mining centre is located about 1.0 km north-east of the tenement, whereas Howley Mining centre is about 12 km west of the project area.

In the region, climate is hot with periodic monsoonal rain between November and April, and for the remainder of the year it is warm to hot and largely dry.

## 3.0 TENURE

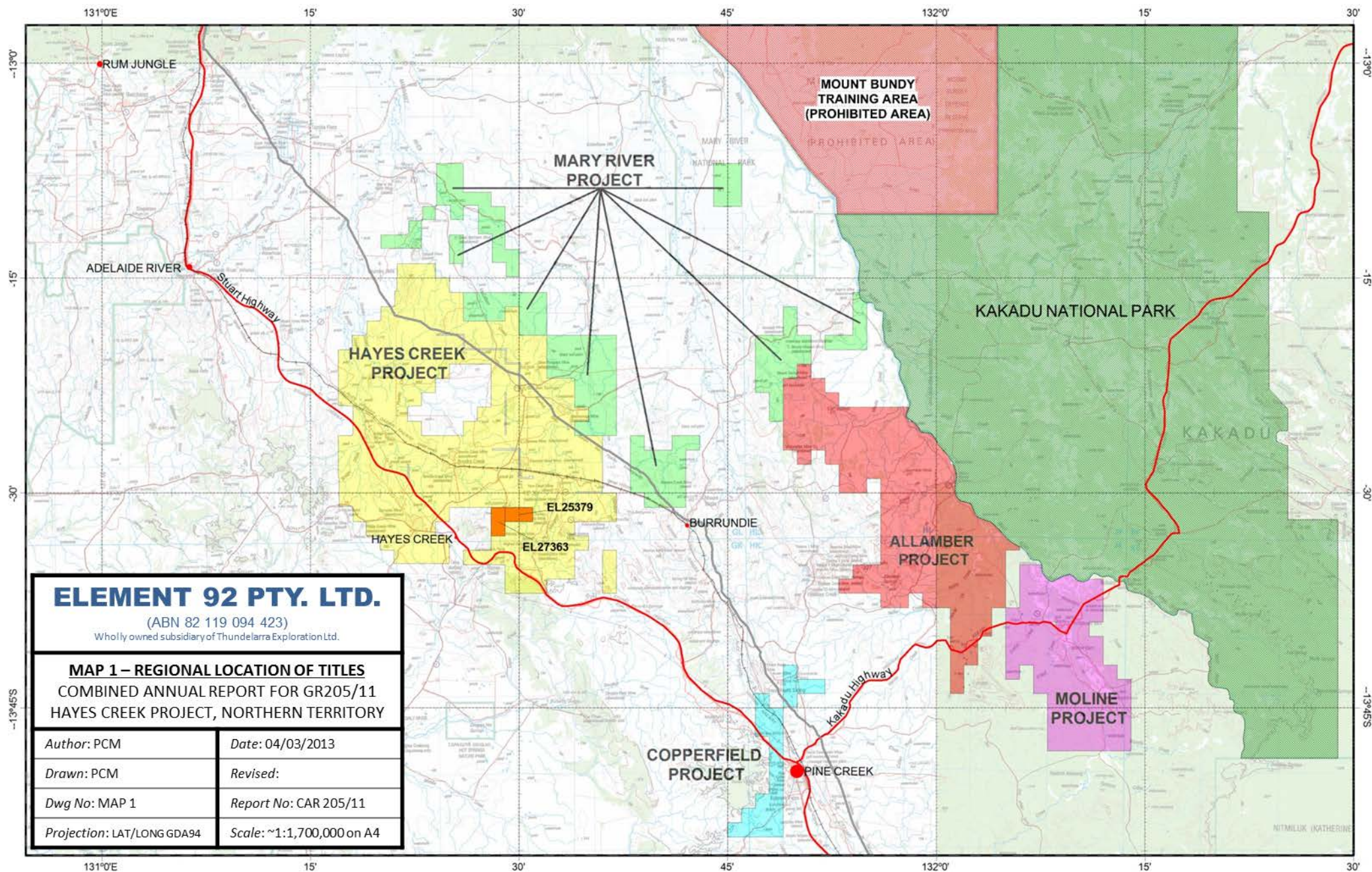
EL 25379 was applied for on 19 May 2006 and granted on 21 February 2007 to A. Dowling and L. Bridge. Element 92 Pty. Ltd., a wholly owned subsidiary of Thundelarra Exploration Ltd. purchased the tenement from the original grantee in 2010, and commenced appraisal of the project area. The tenement was granted for a period of 6 years and will expire on 20 February 2013. A renewal application has been lodged to extend this tenure by 2 years. EL25379 comprises 2 blocks covering 6.68 km<sup>2</sup>.

EL 27363 was applied for on 27 May 2009 and was granted on 12 January 2009 to Element 92 Pty Ltd. The title was granted for a period of 3 years and will expire on 11 January 2013. A renewal application has been lodged to extend this tenure by 2 years. EL27363 comprises 2 blocks covering 6.68 km<sup>2</sup>.

EL No	EL Name	Date Granted	Expiry Date	Area	Covenant
EL 25379	Dowling	21/02/2007	20/02/2013	2 Blocks	\$13,000.00
EL 27363	Jigsaw	12/01/2009	11/01/2013	2 Blocks	\$11,500.00

**Table 1.** Details of titles comprising Pine Creek 2 Group.









## 4.0 GEOLOGY

### 4.1 Geological Setting

The project area is situated within the Pine Creek Orogen (PCO), a tightly folded sequence of Palaeoproterozoic rocks, 10 km to 14 km in thickness, laid down on a rifted granitic Achaean basement during the interval ~2.2-1.87 Ma (Ahmad et al, 1994: Stuart-Smith et al, 1987) . The sequence is dominated by pelitic and psammitic sediments with minor inter-layered tuff units. Pre-orogenic mafic sills of Zamu Dolerite event (~1.87Ma) intruded the lower formations of the South Alligator Group and part of the Mt Partridge Group. During the Top End Orogeny (1870-1800 Ma), the sequence was tightly folded and pervasively altered with metamorphic grade averaging greenschist facies to phyllite. The Cullen Batholith introduced a suite of fractionated calc-alkaline granitic magma into the sequence in the period 1820 – 1850 Ma, and thought to be responsible for introduction of a variety of mineralisation in the adjacent metasediments (Bajwah, 1994).

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.

### 4.2 Local Geology

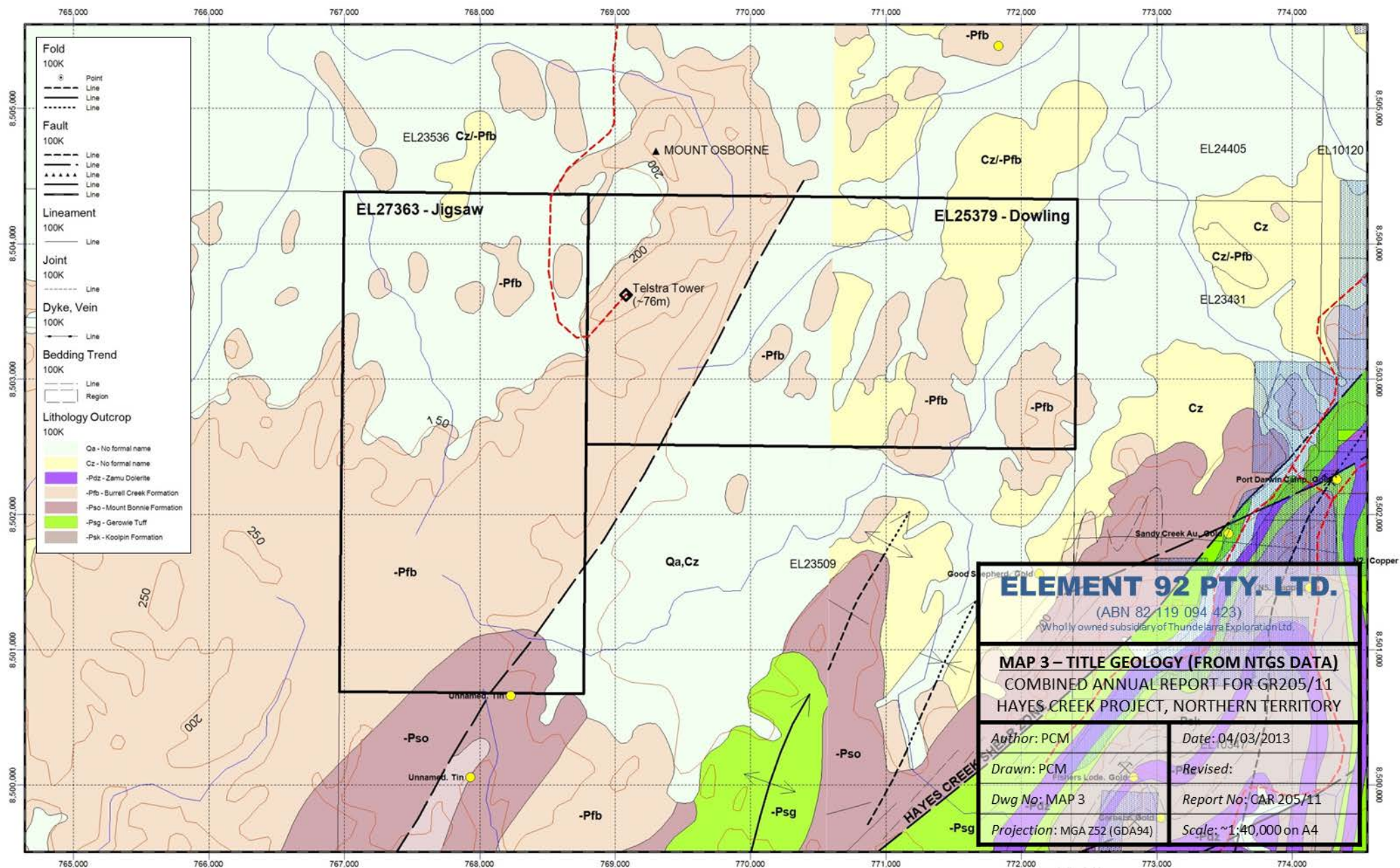
**Figure 3** shows geological setting of the project area based on NTGS – GA GIS data. **Figure 4** shows the local geological and structural settings and indicates that the title geology comprises rocks of Finnis River Group (predominantly Burrell Creek Formation) and South Alligator Group (predominantly Mount Bonnie Formation) folded into anticlinal structures.

The Burrell Creek Formation (Pfb) includes interbedded shale, slate, phyllite, siltstone, greywacke and rare volcanolithic pebble conglomerate, with minor beds of chert and tuff (Stuart-Smith et al, 1987). These lithologies contain a number of gold, base metals, uranium and tin deposits/prospects in the PCO.

Rocks of the South Alligator Group (Ps) are subdivided into Mount Bonnie Formation (Pso), Gerowie Tuff (Psg) and Koolpin Formation (Psk). The Mount Bonnie Formation is the upper unit and rests conformably on the lower members. It comprises slates, mudstone, phyllite, siltstone and greywacke along with minor beds of chert and tuff. Rare beds of iron formation and dolomite may also be present. The Mount Bonnie Formation hosts a number of gold, base metals and tin deposits. The banded iron formation hosts Au-base metals deposits such as Iron Blow and Mount Bonnie. The recent discovery by Element 92 of high grade uranium mineralisation SE of the project area within the Mount Bonnie Formation (Thunderball Prospect) further highlights its metallogenic significance.

An important structural feature is the Hayes Creek Fault Zone, located SE of the project area which appears to be related to recently discovered uranium and gold mineralisation.





## 5.0 HISTORIC EXPLORATION SUMMARY

Area covered by current EL 25379 has been under investigation since 1960's when first edition of the Pine Creek (1:250 000) map was prepared by BMR (now Geoscience Australia). Second Edition Pine Creek map was published by NT Geological Survey in 1993 (Ahmad et al, 1993), which incorporated metallogenic data, and provided a framework for exploration. A regional geophysical cover (WGC, 1999) which includes the project area is available from Northern Territory Geological Survey.

EL25379 is located within well explored part of the region. In the past, exploration for gold, uranium and base metals has been undertaken.

In 1980, under the tenure of EL1338 which overlaps most of the current project area, geological summary was prepared followed by airborne geophysical survey (Kirkpatrick, 1981). Results of this work were not encouraging and eventually EL was surrendered.

Under EL5046 which covers part of the project area, Oceania Exploration and Mining Limited explored and carried out stream sediment sampling together with rock chip samples. These were assayed for gold (Orridge, G.R, 1988). This work disclosed anomalous gold values associated with a zone of quartz-hematite mineralisation in the Burrell Creek Formation in the southwest and within banded iron formation in the southeast.

In and around the current titles, exploration was conducted under EL4219 (Shield, 1988). It involved trenching, geological mapping and soil sampling. Results of assays were disappointing. A Self Potential survey was also carried out over the area but survey failed to detect any structure suitable for gold mineralisation.

Australia Gold and Energy Pty Limited explored part of the project area under EL6029 (Mulroney, 1991). Work consisted of a literature review and an aerial photograph interpretation. The interpretation indicated that the area was underlain by the Burrell Creek Formation and that the outcrops were folded with a central north plunging anticline.

Acacia Resources Limited explored part of project area for gold under EL9428 (Stephens, 2001) Exploration activities included historical data compilation, Landsat, TM interpretation and rock chip/soil sampling program. Gold values as high as 18 ppb were encountered. In addition, a detailed aeromagnetic/radiometric and gravity surveys were completed which led to better geological interpretation (Stephens, 1999). However, results were disappointing and tenement was surrendered.

## 6.0 PREVIOUS EXPLORATION BY ELEMENT 92

Element 92 has undertaken detailed geological and structural mapping of the project area using recent high-resolution airborne magnetic data, remote sensing imagery and photo-geological interpretation methods. Portions of this work were conducted by consultant geologists (Cotton, 2010 & Rankin, 2011). In addition, a number of field visits were undertaken for ground-truthing purposes.

### 6.1 Geological and Structural Mapping

In the titles and surrounding areas, Palaeoproterozoic geology is divided into two main groups, the South Alligator Group and Finniss River Group, in line with the geology shown in **Map 3**.

Based on aerial photographs, imagery, magnetic and radiometric responses, Cotton (2010) divided South Alligator Group into six units whereas Finniss River Group was divided into 2 units. Structure of the area is dominated by open-folding and a major fault structure known as the Hayes Creek Fault Zone which is characterised by secondary splay faults (Cotton, 2010). See **Map 4** for further details.

The title areas lie just NW of the Golden Dyke Dome (GDD), and a working sketch of the principal tectonic elements within the GDD area (from 200 m regional line-spaced magnetic data) is shown in **Figure 1** (Rankin, 2011). The fold axial trend of the GDD swings from a SE-plunge in the south, to a NE-plunge in the north. To the west of the primary fold axis, a series of secondary fold axes (including the Thunderball antiform) follow a parallel arcuate form. These arcuate folds are interpreted as D1 structures. The overall trend of the Thunderball antiform is shown associated with a corridor of potential high-angle reverse faulting (possible blind system).

Structural interpretations indicate the presence of a N to NNE trending antiform (Rankin, 2011) that is secondary/parasitic to the more regional GDD antiform. This feature is best represented in the central part of EL25379, although is also visible (in magnetic terms) along the eastern boundary of EL27363.

The interpretation also highlights several regional targets associated with magnetically-anomalous bodies, within or adjacent to significant antiform hinges and / or strain accommodation zones. These features occur within ground held by Element 92 or its JV partners.

Further details are available in Bajwah (2011a and 2011b).

### 6.2 Mineral Potential

The title areas are located in one of the most productive area within the central part of the Pine Creek Orogen where gold mining activity has occurred since last century. Brocks Creek mining centre is located immediately north of the title area and has produced significant quantities of gold from the rocks of South Alligator Group and Finnish River Groups. Howley mining centre, located a few kilometres west of the title area, has also been active since the last century and at present a major expansion is underway to develop Cosmo Howley (Cosmo Deep) underground mine. Similarly, Fountain Head gold mine is located to the north, and important gold-base metals deposits such as

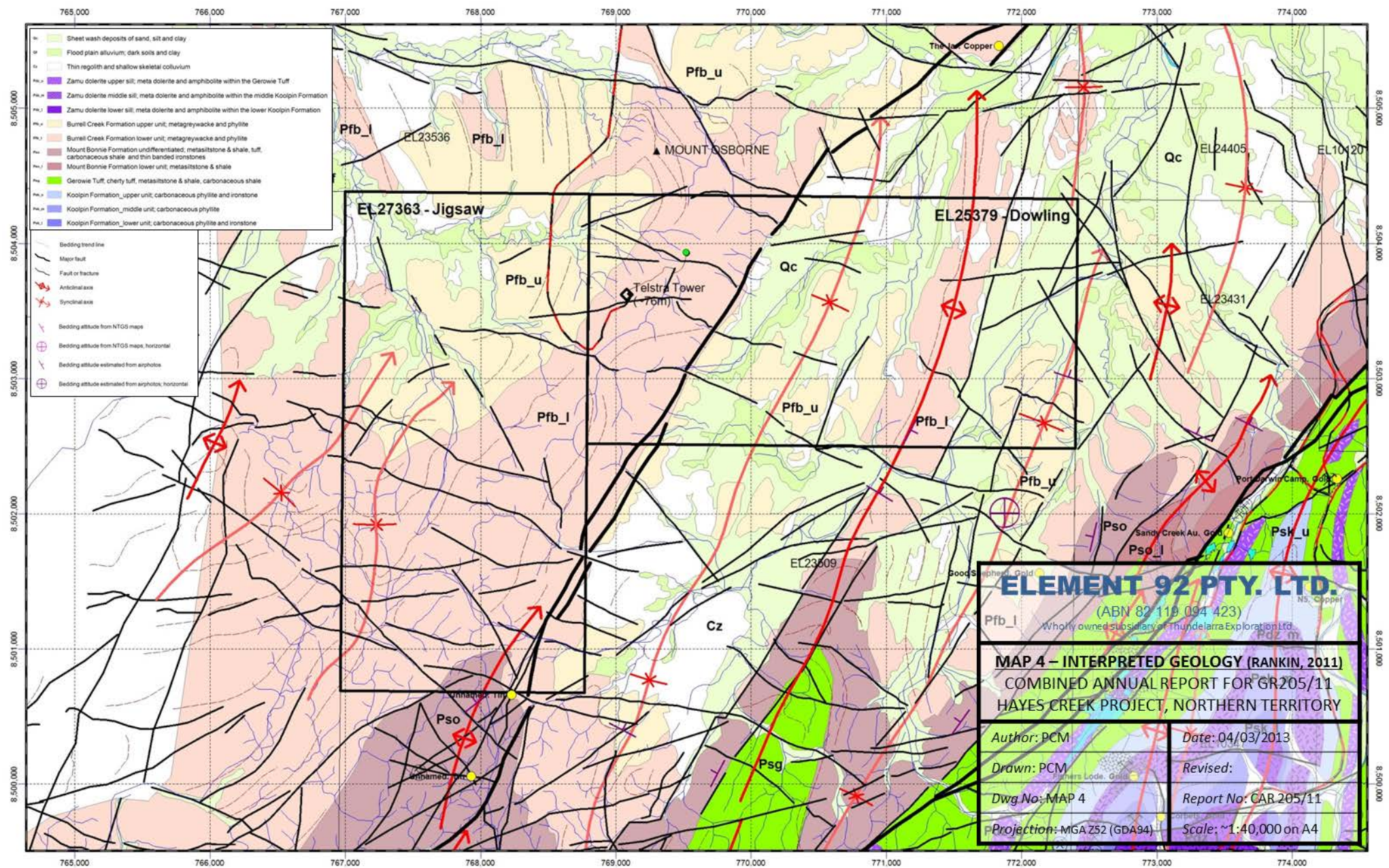
Iron Blow and Mount Bonnie are located only a short distance to the east. The discovery of a high-grade uranium deposit by Element 92 in 2009 at Thunderball Prospect, a few km towards south-east, further highlights the significance of the project area.

Historic exploration conducted in the project area indicates the presence of anomalous gold and base metal values and in some cases these anomalies were not followed up. Recent high resolution geophysical data obtained over the area can help to understand concealed geology and assist in target identification.

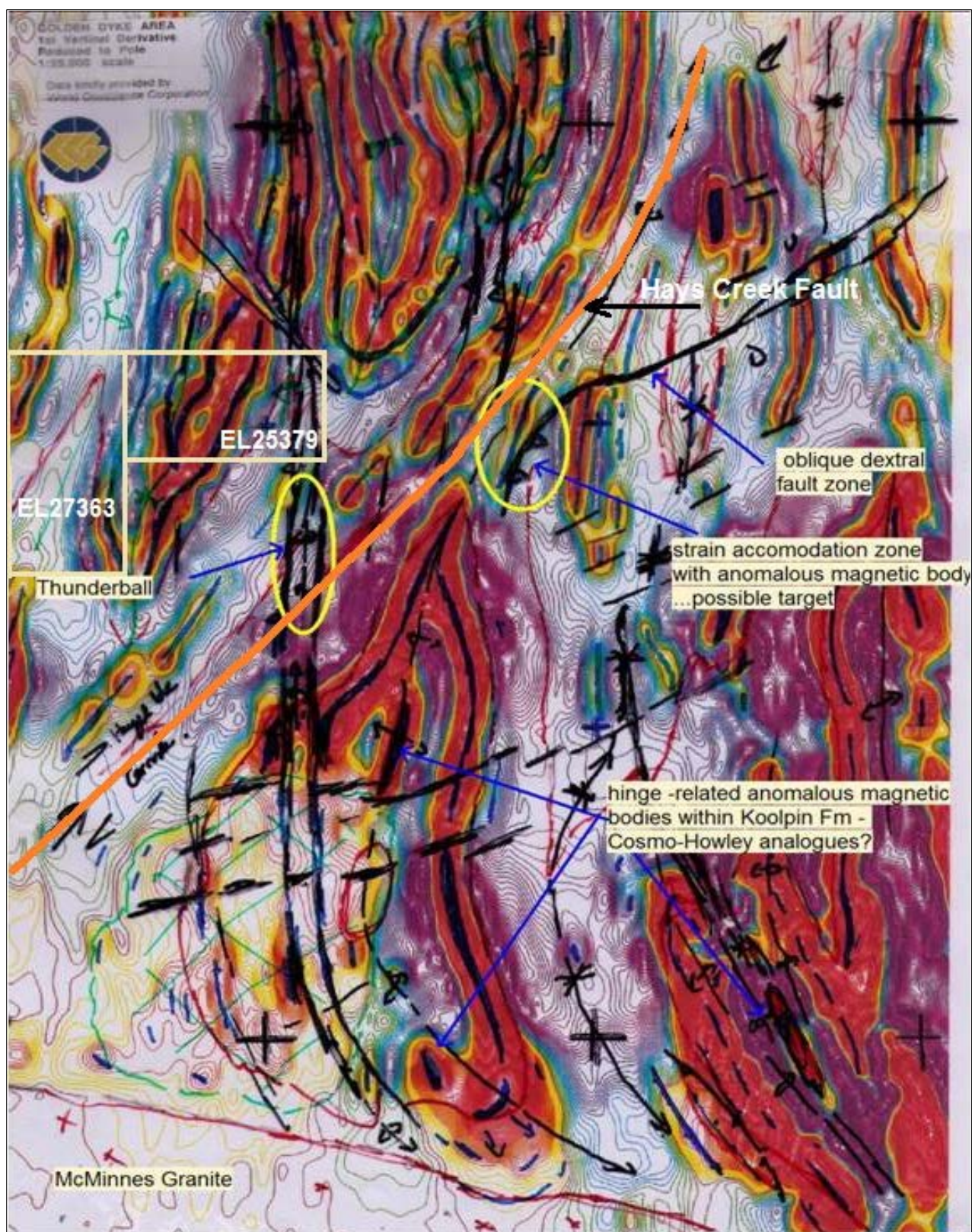
The project area is located in a structurally complex region and is affected by contact metamorphism. An important structural feature is the Hayes Creek Fault (**Maps 3 and 4**) which is known to be associated with mineralisation in the area. In the rock units between Burnside Granite and McMinns Bluff Granite, a number of gold, base metals and uranium deposits/prospects are located. Most of them appear to be related to granite intrusions which in the final stages released metal-rich hydrothermal fluids and mineralisation was deposited in structurally prepared sites.

An unpublished TMI image of the Burnside project area indicates that the Burnside Granite rotated clockwise during ascent and crystallisation while dragging surrounding sediments into S-shaped orientation with Hayes Creek fault clearly marked towards south of the granite body. This image also shows a number of splay faults connecting Burnside Granite with the Hayes Creek fault. Along this fault system, a number of gold and uranium deposits/prospects are located which support the contention that during emplacement of granite body, a large hydrothermal system was generated which is responsible for gold and uranium mineralisation in the adjacent sediments.









**Figure 1.** Sketch map of principal structural elements GDD area (from Isles and Rankin 2011).  
Magnetic data – contoured RTP - 1VD data (regional 200 m line-spaced).

## 7.0 EXPLORATION DURING PERIOD OF REVIEW

During the reporting term, most work involved analysis and assessment of geological and structural mapping carried out by consultant geologists in 2010 and 2011. Interpretation of recently flown high-resolution geophysical data also continued. However, during compilation of data for these titles, it was discovered that 9 drill holes completed in 2010 had not yet been reported to the Department for Mines and Energy NT. This work is reported below.

### 7.1 Drilling

In June and October 2010, drilling was undertaken along the major fault running approximately NNE through the southern portion of EL27363. A total of 9 holes for 1,513m were completed.

The drilling has not previously been reported to the Department against this EL because an incorrect EL code was mistakenly entered into the database for these holes, and this error was not identified because key personnel involved with the programme left the Company soon after. Details of the drilling are provided in **Tables 2 and 3**. Locations of the drill holes are shown on **Map 5**. **Appendices 1 and 2** contain the data in text format.

These holes were part of a 26 hole programme within the Mount Osborne Prospect (falls within EL23509 and EL27363) completed in June, July and October 2010.

The first phase of drilling (12 holes for 1,896m) targeted 2 radiometric and geochemical anomalies along a major NNE-trending fault structure. Several of the holes in the Northern anomaly (lying in EL23509) returned moderately anomalous intercepts (900-2400cps) over narrow widths at >80m down-hole. Results from the 7 holes lying in EL27363 (TPCRC086 to TPCRC092) were generally disappointing with only minor mineralisation detected.

This strongly suggests that the surface anomalism (both radiometrics and rockchips) is caused by a structurally hosted mineralising event. Of note are wide zones of intense shearing and some zones of intense sericite alteration intersected in the drill-holes.

The second phase of drilling (14 holes for 2,142m) aimed to test the radiometrically anomalous trend between Mount Osborne South and Bella Rose North Prospects. Several holes intersected narrow zones of significant mineralisation in the central area, although follow up drilling failed to define economical mineralisation. The drilling has confirmed that the local stratigraphy is in a near vertical position.

TPCRC121 and TPCRC128 were completed in EL27363 and intersected narrow zones of anomalous radioactivity ranging from 600-900cps, which implies the mineralised structure was hit, but failed to identify potentially economic mineralisation. Deep haematitic weathering is a feature of this area.

From these results, it was concluded that the Bella Rose - Mount Osborne trend is characterised by a series of very patchy uranium occurrences within a broad structural corridor. Rather than the mineralisation being localised purely by structure, it would seem likely that weathering and water - table movements have contributed to localised upgrading of mineralisation at certain elevations;



this is not conducive to the formation of significant uranium deposits, rather uranium may be distributed as elevation constrained discontinuous ribbons. Most significant intercepts have been within the transition zone marked by partial oxidation of sulphides and hematite staining on joints. Intercepts down-dip in totally unweathered rock have been generally barren, while intercepts in the weathered zone have been anomalous but generally of rather insignificant grade.

While some of the drilling at Mount Osborne was carried out in the vicinity of some surface pits showing coarse cassiterite in quartz-hematite veining, no significant tin mineralisation was observed in the drill chips. As the veining exposed in the pits is very irregular, localised and discontinuous, this is not entirely surprising. The style of tin mineralisation (coarse, nuggety, quartz vein hosted with little alteration) is such that no mineralisation should be expected outside areas of quartz veining.

Hole Type	Hole Number Range	No of Holes	Total Metres
RC	TPCRC086-TPCRC092, TPCRC121, TPCRC128	9	1,513
Grand Total		9	1,513

**Table 2.** Summary of drilling completed within EL27363 during the 2010 field season.

Hole ID	Easting MGA94 Zone 52	Northing MGA94 Zone 52	RL (GPS)	Azi. MGA	Dip	Depth	Date Start	Date Complete
TPCRC086	768604	8501282	229	300	-60	139	25/6/2010	27/6/2010
TPCRC087	768556	8501197	229	300	-60	139	27/6/2010	29/6/2010
TPCRC088	768493	8501127	229	304	-60	151	30/6/2010	30/6/2010
TPCRC089	768473	8500989	158	306	-60	193	1/7/2010	1/7/2010
TPCRC090	768467	8500994	158	304	-54	175	2/7/2010	3/7/2010
TPCRC091	768489	8500980	157	300	-65	151	4/7/2010	4/7/2010
TPCRC092	768437	8500939	161	260	-60	193	6/7/2010	7/7/2010
TPCRC121	768348	8500830	228	304	-60	180	17/10/2010	18/10/2010
TPCRC128	768343	8500760	231	304	-60	192	24/10/2010	25/10/2010

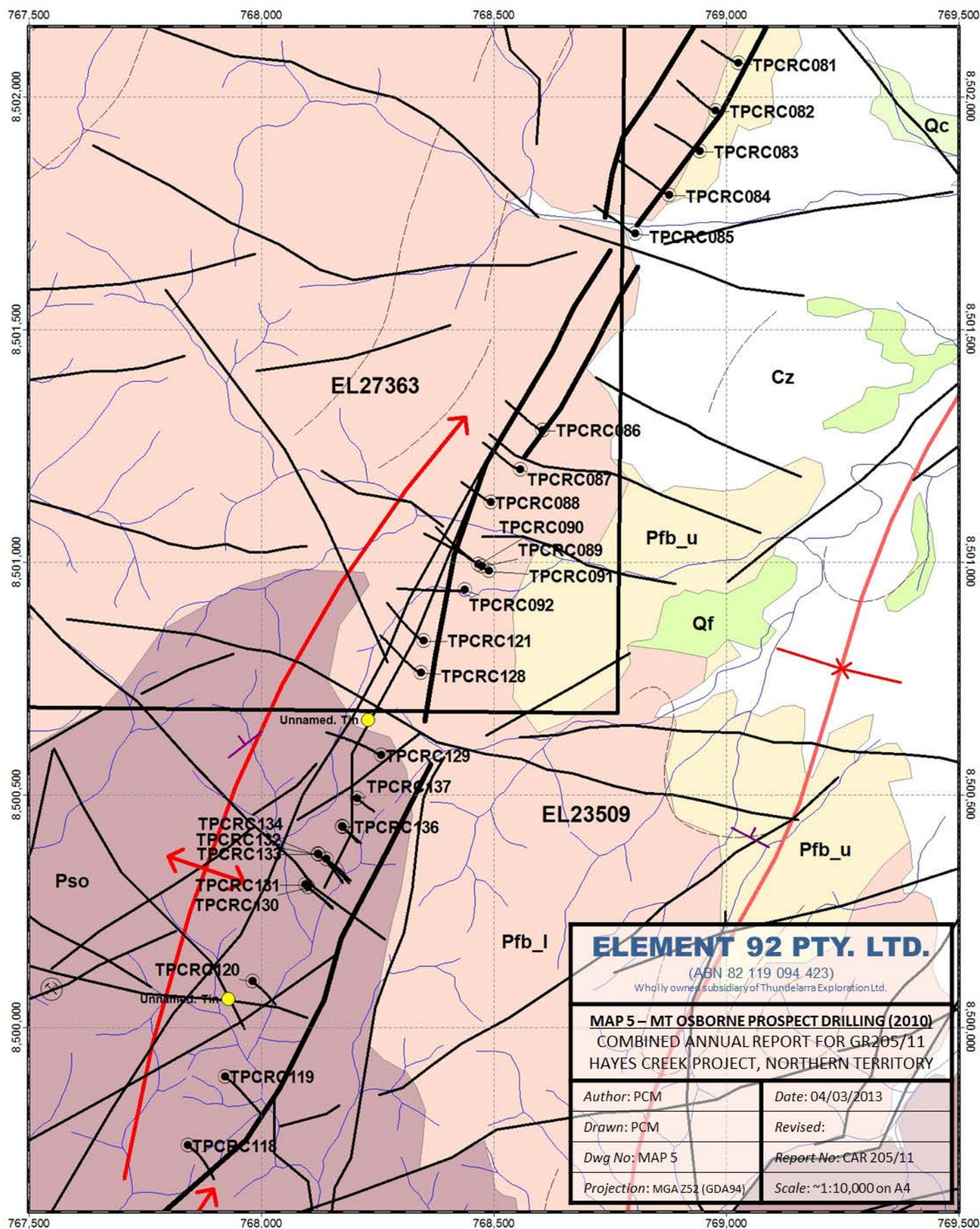
**Table 3.** Details of drilling completed within EL27363 during the 2010 field season.

Drill holes TPCRC086 to TPCRC090 were sampled but were not assayed. A total of 52 samples were collected across the remaining 5 holes. Most samples were from 1 metre splits across intervals where mineralisation was observed or measured with a scintillometer. Samples were assayed at Ultra Trace, Perth for the suite of elements shown in **Table 4**.

Sample Type	Laboratory	Preparation Technique	Assay Technique/s	Analytes
Drill cuttings	Ultra Trace	PR044	ICPMS	Ag, As, Bi, Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Mo, Nd, Pb, Pr, Sm, Tb, Th, Tm, U, Y, Yb
			ICPOES	Au, Co, Cu, Ni, Pd, Pt, Sc, Zn

**Table 4.** Summary of analytical parameters for drill samples collected within EL27363 in 2012 field season.





## 7.2 Review of Existing Data / Target Generation

A review of consultant geological and structural reports (Cotton, 2011 and Rankin, 2011) has highlighted at least one feature which will be followed up by on-ground works in the 2013 field season.

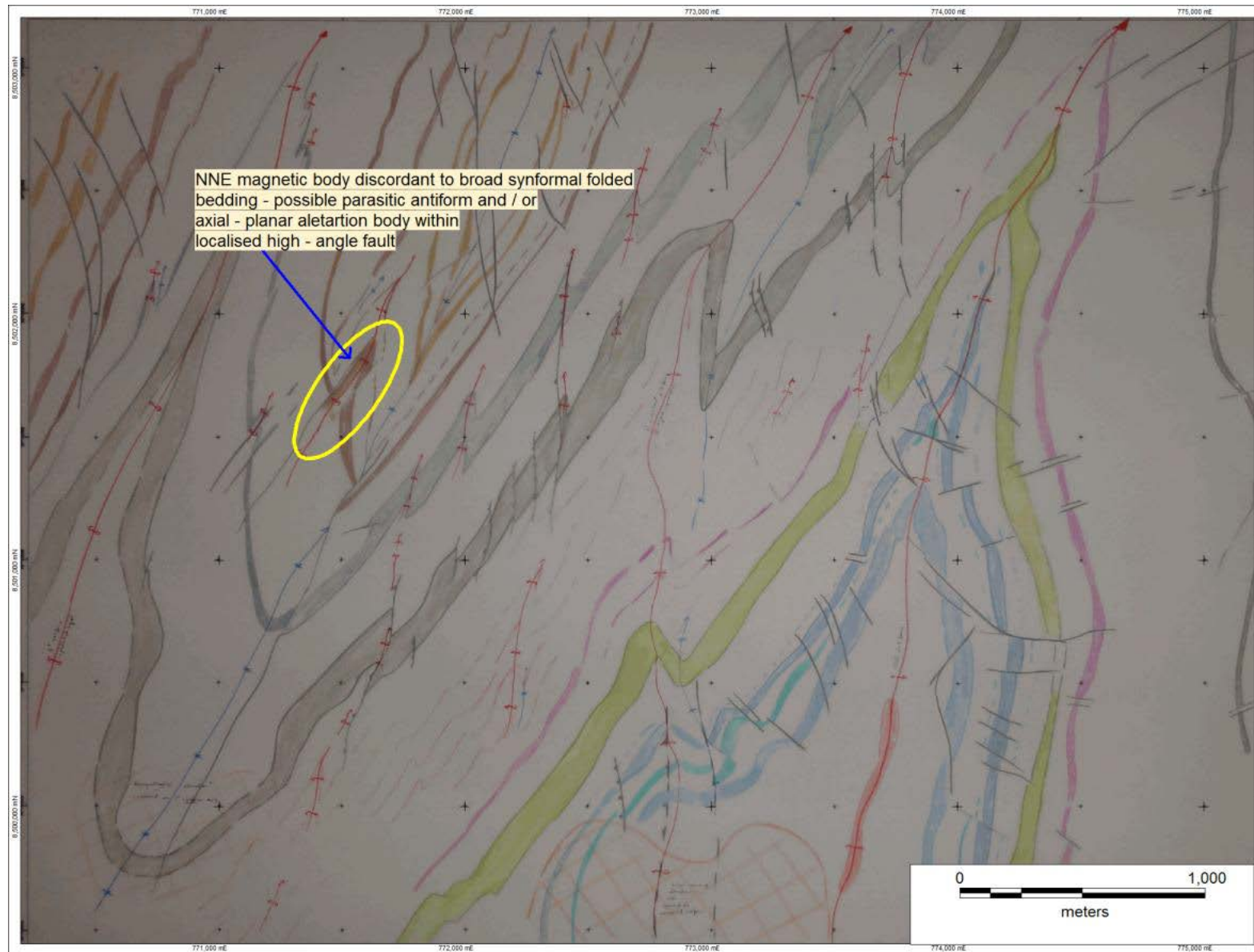
In his analysis of the structural regime of the Thunderball antiform, Rankin identified numerous smaller-scale parasitic antiform/synform axial trends. To the south of EL25379 (in EL23509), a broad synform plunging to the NNE appears to contain a central parasitic antiform that apparently plunges the same direction (Rankin, 2011). This feature is shown in **Figure 2** circled in yellow (Rankin, 2011).

An alternative interpretation by Rankin is that the feature could be an axial-planar parallel high-angle reverse fault. A coincident, linear magnetic anomaly may result from pyrrhotite alteration associated with the fault. Either scenario provides for the possibility of the existence of a significant mineral system, most likely prospective for gold and uranium, although copper mineralisation is known to occur along the line of the interpreted antiform hinge outside the area of interpretation.

The main feature described above lies within EL23509, and most initial work to evaluate the structure will take place in that title. However, the trend of the feature, whether it be an antiform axis or axial-planar high angle fault, continues into EL25379 and will also require assessment. This will likely involve geological traversing and mapping, geochemical sampling of soil and rock, and possibly high-resolution ground geophysical surveys.

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**Figure 2.** Location of minor NNE magnetically-anomalous body, discordant to broad antiform (Rankin, 2011).

## 8.0 CONCLUSIONS and RECOMMENDATIONS

Exploration Licences (ELs) 25379 and 27363 form part of Element 92's Hayes Creek Project and are located about 150 km SE of Darwin and about 55 km north of Pine Creek in the Northern Territory. These ELs were granted combined reporting status (GR205-11) in 2011, and this is second Combined Annual Report, for the year ending on 11 January 2013.

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