ANNUAL COMBINED REPORT (GR 199/11)

ON

EL 24561, EL 25283, EL 25334

NGALIA PROJECT, NT

FOR THE PERIOD

Ending 21 JUNE 2014

(Target Commodity – Uranium)

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Element 92 Pty Ltd (Thundelarra Ltd)
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SUMMARY

Exploration Licenses (EL 24561, EL 25283 and EL 25334) covering the Ngalia Group were granted to Element 92 Pty Limited on 22 June 2009, and will expire on 21 June 2015. These Licenses are located about 330 km NW of Alice Springs and 1200 km SW of Darwin. Element 92 Pty Ltd/Thundelarra Ltd are exploring these tenements for uranium and other commodities.

The project area is located within the Ngalia Basin that is an east-west trending intracratonic basin, which contains a thick succession of Neoproterozoic to Ordovician shallow marine and fluvio-glacial clastic, carbonate and evaporitic rocks, overlain by Devonian and Carboniferous fluvial to continental sandstone, siltstone & shale. Geology of the project area is dominated by the presence of the Mount Eclipse Sandstone. It mainly comprises medium to coarse-grained arkosic sandstone, containing conglomerate lenses. Grey-purple hematitic sandstone is mainly confined to the base of the formation. Much of the project area is covered by Tertiary channel sand sheet, mudstone, calcrete and silcrete. Ancient palaeochannels are located within Tertiary sands which contain uranium mineralisation.

During the reporting period, a technical review of available geological, geophysical, geochemical and drilling data was conducted. The main purpose was to assess the mineral potential of the project area and its continuous viability as an exploration project. For this purpose interpretation of geological and geological data was undertaken and data entered into relational and GIS data bases. A number of field visits were conducted for ground truthing. In addition, rehabilitation activities in the project area were also undertaken. These campaigns led to the identification extensive palaeochannel system containing significant uranium mineralisation, particularly at Afghan Swan prospect. Geological, geophysical and drilling data also indicate that uranium mineralisation is open at depth and along strike.

A technical review of the project area shows that it has the most prospective tenement package in the region, and provides an advantage over competitors for both prospectivity and area wise. Exploration programs conducted, to date, has delineated substantial paleochannel system with high grade uranium mineralisation at shallow depth, which is expected to increase its size with further drilling. High resolution geophysical data have successfully delineated paleochannel system which requires drill-testing. It is highly likely that with further exploration, Afghan Swan uranium deposit will grow in size and new areas of uranium mineralisation of economic grade will be discovered.
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1.0 INTRODUCTION

Exploration Licences EL 24561, EL 25283 and EL 25334 are located about 1200 km SW of Darwin, Northern Territory (Figure 1). In 2011, this group of tenements was granted group reporting status (GR199-11) and was conveniently named Ngalia Group. Element 92 Pty Ltd/Thundelarra Ltd are exploring these tenements for uranium and other commodities, and this report documents exploration activities undertaken during the reporting period ending on 21 June 2014.

2.0 LOCATION AND ACCESS

The Ngalia Group of tenements is located about 330 km NW of Alice Springs and 1200 km SW of Darwin (Figure 1). These tenements can be approached by Stuart Highway, which turns into Tanami Road at about 110 km north of Alice Springs. Tanami Road is partly sealed and then on formed gravel tracks either via Newhaven or Yuendumu - Nyirrpi roads. Vehicle access within the tenements is possible by station tracks, which may be impassable during wet season.

3.0 TENEMENT DETAILS

The group of ELs was granted to Element 92 Pty Limited from on 22 June 2009, and will expire on 21 June 2015. Details of these tenements are given in Table 1.

<table>
<thead>
<tr>
<th>EL No</th>
<th>Date Granted</th>
<th>Expiry Date</th>
<th>Area</th>
<th>Covenant</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 24561</td>
<td>22/06/2009</td>
<td>21/06/2015</td>
<td>16 blocks</td>
<td>$29,500.00</td>
<td>Element 92 Pty Ltd 100%</td>
</tr>
<tr>
<td>EL 25283</td>
<td>22/06/2009</td>
<td>21/06/2015</td>
<td>90 blocks</td>
<td>$46,500.00</td>
<td>Element 92 Pty Ltd 100%</td>
</tr>
<tr>
<td>EL 25334</td>
<td>22/06/2009</td>
<td>21/06/2015</td>
<td>323 blocks</td>
<td>$00.00</td>
<td>Element 92 Pty Ltd 100%</td>
</tr>
</tbody>
</table>

To meet NT Mining Act requirements, 177 sub-blocks of EL 25334 were relinquished in 2013, leaving behind 323 sub-blocks.
Figure 1: Location of the Project area
4.0 GEOLOGICAL SETTING

The Ngalia Basin is an east-west trending intracratonic basin which contains a thick succession of Neoproterozoic to Ordovician shallow marine and fluvio-glacial clastic, carbonate and evaporitic rocks, overlain by Devonian and Carboniferous fluvial to continental sandstone, siltstone & shale. Seismic data indicate that the basin is asymmetric and attains a maximum thickness of approximately 4.5km. Sedimentation was terminated by the Alice Springs Orogeny, which was initiated in the Early Carboniferous.

This orogenic event produced widespread folding and faulting, with deformation being focused on the northern margin of the Basin. Mesoproterozoic post-tectonic granites of the Southwark Granitic Suite and older, high grade metamorphic rocks (together representing the Arunta Inlier), form the basement to the Ngalia Basin. The granitic rocks are known to be anomalously rich in uranium, and are likely to be the ultimate source of the widespread uranium mineralisation in the Basin.

In the central and southern portions of the basin the Proterozoic and Palaeozoic rocks are covered by a veneer of discrete Cretaceous to Tertiary basins that locally exceeded 220m in thickness. The Tertiary sequence in this area is poorly described; however other such basins in the Alice Springs area are thought to be the result of two distinct periods of deposition (Senior et al 1994). The Lower Tertiary consists of an upward fining sequence, with flowing channel sands at the base locally capped by dark grey & black carbonaceous mudstones and green swelling clay. A zone of calcrete, silcrete or laterite separates this sequence from pervasively oxidised and locally magnetic Upper Tertiary sands and gravels that cover much of the area.

Geology of the project area is dominated by the presence of the Mount Eclipse Sandstone (Figure 2). Uplift and erosion of the Arunta Region rocks bordering the Ngalia Basin at 350 – 370 Ma marked the start of deposition of the Mount Eclipse Sandstone, the youngest unit preserved in the basin (Young et al., 1995). The Mount Eclipse Sandstone is dominated by medium to coarse-grained arkosic sandstone, containing conglomerate lenses, which may be broadly divided into three types. Coarse-grained, poorly bedded sandstone is predominant and is interbeded with medium-grained, well-bedded along with quartz pebbles in places. Grey-purple hematitic sandstone is mainly confined to the base of the formation (Young et al., 1995). Carbonaceous material is common, and 7 m of lignite has been intersected in drilling (Spark, 1975). Deposition is interpreted to have occurred in a continental fluvial environment, sourced mainly from uplifted rocks of the Arunta Region.
Figure 2: Geological Setting of the project area
5.0 URANIUM MINERALISATION AND EXPLORATION MODEL

The principal target of Thundelarra’s exploration efforts within the Western Ngalia Basin is uranium mineralisation that is amenable to ISR and which is hosted by the Tertiary sediments that cover large portions of the basin. A secondary target is Bigrlyi-type uranium mineralisation hosted by the Carboniferous Mt Eclipse Sandstone (Figure 3).

Figure 3: Schematic cross section through the Ngalia Basin looking west (modified after Young et al 1995) showing target uranium mineralisation styles.

Tertiary-hosted uranium deposits
Thundelarra has discovered significant and widespread uranium at depth within the basal Tertiary channelling sands where they come into contact with carbonaceous mudstones and sandy clays (more below).

Tertiary sediments cover large portions of the central and southern Ngalia Basin, and indeed around 99% of the Thundelarra tenure. The Tertiary sequence has been found to exceed 220m in drilling conducted by AGIP close to the southern margin of the Basin (hole SR9R). The Tertiary sediments have two excellent uranium source rocks – the Mt Eclipse Sandstone, and the older Southwark Suite granites. The Mt Eclipse is a particularly good source rock because:

- It hosts widespread uranium anomalism (see Figure 2).
- It was exposed throughout the Tertiary to erosion (i.e. reworking into Tertiary sediments) and oxidation.
The uranium is physically accessible to oxidising ground-waters as it is found within the Mt Eclipse coating sand grains.

The uranium is in the form of uraninite, which can be easily leached by oxidised waters.

The Mt Eclipse is exposed in the north, and groundwater flow is to the south, and into the Thundelarra licenses.

Thundelarra will actively search for suitable hydro-geological & chemical traps within this Tertiary sequence. To this end, Thundelarra has:

- Mapped a substantial & structurally controlled Tertiary sub-basin in the south-eastern part of the Ngalia Basin.
- Processed satellite (ASTER night-time) temperature mapping data.
- Conducted a airborne magnetic/radiometric surveys.
- Conducted 1km-spaced gravity survey,
- Commenced follow-up mud rotary & diamond drilling.

Across the Project, a number of paleochannel targets have been interpreted from the ASTER and airborne magnetic data. Visual porosity estimates from core samples indicates that excellent hydro-geological conditions exist for in-situ recovery (ISR) mining techniques, with mineralised sands being capped by an impervious mudstone.

Good potential therefore exists for ISR-amenable paleochannel-style deposits within the Tertiary sediments of the Ngalia Basin. Similar deposits are found in the Frome Embayment of South Australia (Beverley, Four Mile, Honeymoon etc), and these mines tend to have low operating costs and very low environmental impact. Recent AEM survey has been able to detect the paleochannel systems that host the Tertiary mineralisation. This survey has provide direct targets for stratigraphic drilling in areas of thick cover where the conductivity data suggests the presence of channels (dendritic patterns) and carbonaceous mudstone units (high conductivity layers). A regional map of the thickness of the Tertiary sediments will be interpreted, along with the location of channel systems, and this will target further drilling across the Project area.

**Carboniferous sandstone-hosted uranium deposits**

Bigrlyi-type uranium mineralisation, hosted by coarse feldspathic sandstones in the Mt Eclipse Sandstone is another target. Significant uranium is also known at the Minerva (2.43 Mlbs U3O8 - AGIP 1983), and Walbiri occurrences (1.49 Mlbs U3O8 – NTGS Orestruck Uranium Factsheet, Nov 2009).
The principal host to uranium mineralisation in the Ngalia Basin is the Mt Eclipse Sandstone – a thick, synorogenic sequence of non-marine sandstone and shale, deposited in piedmont and subaerial deltaic environments (Questa, 1989). The uranium mineralisation at Bigrlyi is known to be related to those parts of the Mt Eclipse Sandstone that contain abundant carbonaceous material. However other parameters, related to fluid flow during the mineralising event (e.g. alteration, paleo-porosity & structural setting) are also important facets of the Thundelarra exploration program.

The Bigrlyi deposit has been described as a tabular deposit formed by the interaction of uranium-bearing, oxidising fluids with reducing carbonaceous matter in a permeable sandstone formation. Fidler et al. (1990) have suggested that Bigrlyi was formed in the Mt Eclipse Sandstone prior to the completion of diagenesis. Uranium-bearing fluids are proposed to have originated from weathering profiles of granites in the exposed Arunta complex and to have migrated into the Ngalia Basin. Within this model, diagenesis of the Mt Eclipse Sandstone would have ‘fixed’ the uranium deposits. Subsequent faulting and fracturing have modified the distribution of mineralisation to a limited extent.

Significantly, the final stages of deposition of the Mt Eclipse Sandstone occurred synchronously with the culmination of major structural movements in the Ngalia Basin, during the Alice Springs Orogeny (ASO); a tectonic event with widespread & profound structural / metallogenic significance. It appears that the ASO-related thrusting within the Ngalia basin might have played a critical role in the formation of these deposits in a variety of ways such as:

Acting as the driving force for the movement of fluids responsible for alteration and mineralisation,

- Creating favourable conduits for the movement of fluids,
- Producing repetitions of the favoured traps (e.g. carbonaceous horizons) within the Mt Eclipse Sandstone,
- Acting as a tectonic “fixing” agent, creating a fossilised redox system by the dewatering action of structural tilting.

The uranium mineralisation within the Mt Eclipse is likely the result of a variety of processes acting in concert, and consequently a variety of deposit styles can be expected as these processes compete for relative dominance. This is certainly the case in other sandstone-hosted uranium provinces such as the Colorado Plateau in the USA or the Frome Embayment in South Australia. One fundamental parameter, however, is the porosity of the host rocks. In clastic sediments the porosity is initially a function of grain size. A classic demonstration of the control that grain-size may have on mineralisation is found in South
Texas (Figure 4), where uranium deposits are spatially associated with the coarser sediment, the distribution of which is controlled by the overall structure of the basin. This primary porosity can be markedly reduced during diagenesis and compaction as groundwaters fill the pore space with carbonate cement. This diagenetic event is likely to have coincided with both the Alice Spring Orogeny and the main uranium mineralising event.

**Figure 4. Sandstone-percentage map of the Oakville (Miocene) bedload fluvial system, South Texas Coastal Plain, illustrating coincident distribution of uranium mineralisation and coarse grain size (Modified from Galloway and Hobday 1999). The gravity ridge that runs through Project area is thought to have been a basement high that resulted in an analogous grain size distribution in the Mt Eclipse.**

have coincided with both the Alice Spring Orogeny and the main uranium mineralising event.

### 6.0 PREVIOUS EXPLORATION ACTIVITY

Exploration within the Ngalia Basin has been almost exclusively for either oil/gas or uranium targets. No exploration for oil/gas has been conducted since Magellan Petroleum (Aust.) Ltd drilled the Newhaven-1 well in 1998. The first phase of uranium exploration ceased in 1983 due to political reasons. The demonstrated potential of the Basin to host significant uranium
resources has recently led exploration companies back into the area. Whilst shallow & low grade calcrite occurrences have been outlined at Cappers (Energy Metals Ltd) & Currinya (Cauldron Energy Ltd), previous exploration has neither targeted nor encountered sandstone-hosted uranium in the lower Tertiary sequence.

7.1. Oil/Gas

Prior to the start of the uranium exploration programs in the mid 1970’s the only recorded exploration in the area were seismic and gravity surveys directed toward oil/gas discoveries. Over 1400km of seismic lines were shot, and two petroleum wells, Davis-1 and Newhaven-1 have been drilled in the basin, and both have been drilled to the crystalline basement. The Newhaven-1 was drilled within the area now covered by EL25283.

7.2. Uranium – 70’s & 80’s

The Ngalia Basin was the subject of intense exploration for uranium in the 70’s and early 80’s, principally by Agip Australia Pty Ltd, Central Pacific Minerals NL, Urangesellschaft Australia Pty Ltd and AFMECO Pty Ltd. These companies, often in joint venture, held a large number of ELs in the Ngalia Basin in their search for sandstone hosted uranium mineralization in the Mt Eclipse Sandstone. The initial discovery of uranium mineralisation in the lower part of the Mt Eclipse Sandstone occurred in 1971. Exploration was at that time focussed on the northern margin on the Basin to which area the prospective outcrop was restricted.

In 1973, discovery of carnotite mineralisation at Bigrlyi resulted from a basin-wide systematic ground radiometric survey across units of the Mt Eclipse Sandstone. From 1974 to 1983 a comprehensive exploration program was undertaken on the Bigrlyi project including regional and detailed geological mapping, percussion and diamond drilling, mineral resource calculations and preliminary metallurgical extractive testwork.

Agip were actively engaged in exploration during the period 1977 to 1983 and many of their tenements fell wholly or partly on the current project area. Due to the area being totally covered by recent sediments their prime exploration tool was vertical stratigraphic drilling. The main drilling method was rotary drilling with many holes extended with diamond core tails. The drilling programs were restricted to the eastern third of the Project area. The recent cover virtually masked any response from airborne radiometric surveys. Several gravity surveys were completed to assist with structural interpretation of the basin.

7.3. AGIP EL 1199
E.L. 1199 “Yungarra” was granted to Agip on February 9th, 1977, with the primary aim of exploration for sandstone-hosted uranium mineralization. Due to a total lack of outcrop of prospective rocks, drilling was the primary exploration tool. Agip completed 36 vertical rotary holes totalling 5,478m within the project area with 11 of the holes completed by diamond tails totalling 616m of core. Hole spacing varies considerable from less than 100m to over 10km. Their drilling confirmed that the eastern part of the area is underlain by Mt Eclipse Sandstone with thicknesses varying up to > 130m. Many of the holes were not drilled to basement. The sandstone is in turn overlain by Tertiary sediments varying from 34m to 130m thick. In places the Mt Eclipse Sandstone is absent either due to palaeo basement highs or was stripped off during the Tertiary. Eighteen of the holes intersected reduced or transitional facies Mt Eclipse Sandstone varying in thickness from 7m to > 82m. Narrow zones of uranium mineralization were intersected in a few holes with the best as follows (also, see Figure 1).

Table 2: Summary of Uranium intercepts – AGIP EL 1199

<table>
<thead>
<tr>
<th>Hole</th>
<th>From (m)</th>
<th>To (m)</th>
<th>Interval (m)</th>
<th>U3O8 (ppm)</th>
<th>eU3O8 (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRD066</td>
<td>162.5</td>
<td>163</td>
<td>0.5</td>
<td>5248</td>
<td></td>
</tr>
<tr>
<td>YRD112</td>
<td>177</td>
<td>178.5</td>
<td>1.5</td>
<td>157</td>
<td></td>
</tr>
<tr>
<td>YRD206</td>
<td>197</td>
<td>201</td>
<td>4</td>
<td>1240</td>
<td></td>
</tr>
<tr>
<td>YRD207</td>
<td>116.6</td>
<td>118.8</td>
<td>2.2</td>
<td>216</td>
<td></td>
</tr>
</tbody>
</table>

In addition to the drilling programs, gravity, Sirotem, and ground resistivity surveys; water bore sampling and petrological and palynological studies were also carried out.

7.4. AGIP EL 1302
EL 1302 “Cassidy Bore” was granted to Agip Australia Pty Ltd on February 9th, 1977. The main exploration activities carried out were drilling, down-hole logging and gravity surveys. The gravity survey was part of a trial survey conducted by AGIP in conjunction with the NTGS. AGIP reported the results over EL 1302 as being inconclusive. Stratigraphic vertical drilling was the main exploration tool with 37 holes for 3,772m completed. Three of the holes were extended by diamond drilling with a total of 167m of coring completed. The holes intersected from 0 to >150m of Mt Eclipse Sandstone though it was mostly oxidised facies sediments. Only four holes
intersected reduced facies rocks with the maximum thickness being 32m however three of the holes stopped in the reduced facies. Downhole radiometric logging did not identify and significantly anomalous zones with the best being 4x background. No samples from any of the holes were assayed.

7.5. AGIP EL 1310
AGIP explored EL1310 “Siddley Range” which included the southern part of the current project area between 1978 and 1982. Exploration completed included stratigraphic drilling and a gravity survey. A total of 10 vertical rotary holes were completed for 1,739m which included 6 diamond core tails for 505m. The holes were drilled at extremely broad spacings with up to 17km between holes. All holes intersected Mt Eclipse Sandstone with thicknesses up to >220m. Two holes intersected the Devonian Kerridy Formation (near Djabangardi Hill) with the remainder stopping in Mt Eclipse Formation. Three of the holes intersected reduced or transitional facies sediments in multiple zones varying from a few metres up to 58m wide. Weakly anomalous radioactivity up to 66ppm eU₃O₈ was recorded in three holes.

7.6. AGIP EL 2081
AGIP was granted EL2081 “Yarragan” in late 1979. AGIP had previously held the same ground as part of EL 1199. The tenement covered the eastern portion of the current project. As with other tenements their main exploration tool was stratigraphic drilling. They also completed a regional gravity survey to further assist in the interpretation of a probable sub basin structure previously identified. A trial VLF electromagnetic survey was carried but results were inconclusive due to the thickness of conductive overburden.

AGIP completed 22 holes for 4,409m included in this total is 1,819.5m of diamond core tails in 15 of the drill holes. Five holes intersected reduced facies Mt Eclipse Sandstone up to a maximum thickness of 104m. Low level radiometric anomalies were reported from four holes. No samples were submitted for assay.

7.7. Element 92 Pty Ltd
During 2009-10 reporting year, Element 92 Pty Ltd undertook reconnaissance mapping, elicopter-assisted gravity surveying, airborne magnetic/radiometric survey and data
Element 92 Pty Ltd/Thundelarra are also participating in the CSIRO-managed Joint Surveys Uranium project, which is examining uranium mineral systems in the Ngalia Basin.

### 7.0 EXPLORATION ACTIVITY YEAR ENDING 21 JUNE 2014

During the reporting period, a technical review of available geological, geophysical, geochemical and drilling data was conducted. The main purpose was to assess the mineral potential of the project area and its continuous viability as an exploration project. For this purpose interpretation of geological and geological data was undertaken and data entered into relational and GIS data bases. A number of field visits were conducted for ground truthing. In addition, rehabilitation activities in the project area were also undertaken. To date, Element 92 has spent over $4.5 million in the Ngalia Project on exploration programs, leading to discovery of large uranium-rich ancient palaeochannel systems with significant uranium mineralisation at the Afghan Swan prospect. Exploration Index map of the project area is shown in Figure 5.

Element 92 Ltd considers the Licence an important in the Ngalia Uranium Project. However, uranium exploration is facing extremely challenging environment due to price collapse in recent years. As a result of that junior explores are facing great difficulty in raising capital in this environment. The company is actively pursuing potential partners to provide the funding necessary to fully and rigorously explore the uranium potential of its Ngalia Basin Uranium Project. Discussions are underway with a number of interested parties who have the financial capacity and the positive long-term view of the uranium price outlook required to be able to advance exploration of the tenements comprising the Ngalia Basin Uranium Project.

The Ngalia Uranium project has been explored by high resolution magnetic/radiometric, AEM geophysical survey along with helicopter-assisted precision gravity survey from 2010 to 2012. During that period, Soil and rock chip sampling/assaying were also conducted which led to the identification of numerous exploration targets. All geophysical and geochemical and drilling data have already been lodged with NT Dept of Mines and Energy (Bajwah and Moloney, 2011; Bajwah and Mill, 2012). Processing and interpretation of geological and geophysical and data identified an ancient paleochannel system under cover totaling in excess of 400 km in linear length, which appears to be prospective for uranium mineralisation within the project area. Drilling programs in 2010-12 reporting periods intersected significant uranium mineralisation extending over about 15 kilometres of the
Figure 5: Exploration Index map of the Ngalia Project
buried palaeochannel system at the Afghan Swan prospect, making it the maiden uranium discovery within the palaeochannel system. To date, 155 holes (MR, AC, RC and DD) have been drilled for a total of 20,844 metres to test the zones. This is the only part of the extensive paleochannel system within the Ngalia Basin Project area that has been tested so far. Element 92 also participated in CSIRO-led study of uranium mineral systems in the Ngalia Basin to better understand mineral plays in the region.

7.1 Geological Data Interpretation

In 2011, a collaborative study was undertaken under the auspices of CSIRO with participating organisations such as NTGS, MDU and exploration companies (Schmid et al., 2011). The project aim was to build upon existing knowledge base about uranium mineralisation in the Ngalia Basin, and contribute to 1) the understanding of uranium fluid pathways and mechanisms of mineralisation on deposit scale, and 2) the understanding of the basin architecture. This investigation showed that the Ngalia Basin has complex architecture and contains a central high area which is cut by numerous reverse faults.

In the region, rocks of the Mt Eclipse Sandstone are dominant which appears vertical dipping ridges, whereas mudstones are commonly eroded and form depressions (Young et al. 1995). Faults or fractures in sandstones are narrow and show local displacement of sediments and mineralisation. Sediments below the mineralised zone tend to have a higher abundance of gravel and cobble size rounded clasts at the base of channels. Carbonate cemented sandstones are distributed heterogeneously throughout the Mt Eclipse Sandstone. Faults within granites trend parallel to basin margin and are highly mylonitic.

Sedimentological study indicates that deposition of Mt Eclipse Sandstone took place in high relief continental basin dominated by episodic rainfall and semi-arid environment. The common occurrence of calcrete suggests that evaporation greatly exceeded the precipitation. Episodic tectonic activity during the Alice Springs Orogeny led to thick, immature, stacked fluvial channel deposits, intercalated with flood plain playa deposits during time of stagnation.

Mineralogical and petrographic studies indicate that sandstones were mainly derived from a granitic source (Schmid et al. 2011). Uranium mineralisation took place early in the sedimentation cycle before calcite cementation, and is present only in samples that contain V-minerals. Uranium re-precipitated along adjacent quartz grains and caused them to etch. Weathering and transport in meteoric/groundwater led to deposition of vanadium-rich micas and precipitation of uranium (Figure 6).
First-stage uranium mineralisation is most likely to occur from lower slopes of an alluvial fan and towards distal extension of the alluvial fan system intercalated with floodplain deposits, where flow rates are slow. Dispersion into overlying units or other parts of the depositional system may occur as secondary re-mobilisation (e.g. Tertiary uranium deposits located in palaeochannels).

7.2 Geophysical Data Interpretation

High resolution geophysical survey of the project area provided major break-through in identifying fertile palaeochannel system, which contained uranium mineralisation at shallow depth. Processing and interpretation of AEM geophysical survey along with gravity survey of the project area has added much to our understanding of subsurface geological features which have major control on uranium mineralisation within Tertiary sediments. Figure 7 displays gravity boosted AEM image and provides the best opportunity to identify paleovalleys and palaeochannels, which are important features for uranium mineralisation. The image shows subsurface ancient palaeochannel system which dominates the project area. The palaeochannels generally are oriented EW and occurs as branching tree pattern. This profile is located at a depth of approximately 130 m deep and it is highly likely that it extend down dip. Approximately, 150 targets (black spots) are shown based on the geophysical data. Figure 8 shows the palaeochannels system at depth with
Figure 7: Grid of combined AEM and regional gravity data. The image clearly defines channel-like features across the basin as red to yellow sinuous anomalies. Black spots are possible exploration targets interpreted from geophysical data.

Figure 8: Paleochannels with respect to geology of the project area
respect to geology within Tertiary sediments that define uranium mineralisation in the Ngalia Basin. Significant drill holes are also shown in Figure 8. Figure 9 shows evidence of subsurface paleo-channel which has recorded significant results for uranium mineralisation at Afghan Swan. Anomaly associated with the paleo-channel system has been traced over 57 km in the project area. These paleo-channel systems appear to be sub-parallel to the gravity anomaly. Drilling undertaken indicate that mineralisation at Afghan Swan follow the trend as shown by Airborne EM data (Figure 8). The TEMPEST data appears to be useful in locating Tertiary paleo-valleys, within which a mineralised channel may be found. It may be noted that uranium mineralisation trend is restricted within the paleo-channel as shown by the drilling results (Figure 9). Those drill holes which are located outside the channel are mainly barren. These paleo-channel systems appear to be sub-parallel to the gravity anomaly (Bajwah and Mill, 2012). Drilling undertaken to date indicate that mineralisation at Afghan Swan follow the trend as shown by Airborne EM data (Figures 8 and 9).

7.3 Drilling

From 2010 – 2012, extensive drilling programs were undertaken in the project area to identify uranium mineralisation within palaeo-channels. To date, only small part of the extensive paleo-channel system within the Ngalia Basin Project has been tested.

Figure 9: TEMPEST AEM with depth profile image of Afghan Swan uranium prospect. Significant drill holes with assay data are also given.
Drilling campaigns targeted paleochannel type uranium mineralisation, which was identified by AEM and gravity geophysical data (Figures 7, 8 and 9). These campaigns met with early success and significant intercepts from stratigraphic horizons were returned. Mineralisation is confined to Tertiary grey fine sands, which is up to 45 m thick with the scope to identify paleochannel uranium deposits of substantial scale. Significant assay results are given in Table 3. Drill hole TNG061RC returned an intercept of 7.1 m @ 1408 ppm eU₃O₈. Similarly, another drill hole TNG095RC had 1.6 m at a depth of 144.3 m returning 1174 ppm eU₃O₈. Typical mineralogy is anatase, uraninite, pyrite and LREE enriched hydrated phosphates. Wireline composite eU₃O₈ (ppm) values from EL24561 were not encouraging which ranged from 5 ppm to 55 ppm with an average of 19 ppm (eU₃O₈).

Figure 10 shows downhole lithological package interpreted from previous drilling data. In this diagram downhole geology logs have been refined using XRF assays and gamma logs, which helped to interpret broad sediment package. The data clearly indicate the presence of a lower basal sand unit in TNG126 and TNG061 that is not identified in TNG156. It appears that in this area at least, significant mineralisation is concentrated in the lower sand unit, and it is open along strike and depth as indicated by geophysical data.

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<th>Hole</th>
<th>Easting (metres)</th>
<th>Northing (metres)</th>
<th>From (metres)</th>
<th>To (metres)</th>
<th>Interval (metres)</th>
<th>Grade (ppm eU₃O₈)</th>
<th>Gr x t’ness (m, ppm eU₃O₈)</th>
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8.0 CONCLUSIONS AND RECOMMENDATIONS

Uranium industry is facing challenging environment due to fall in uranium price in recent times, which is responsible for difficult conditions what uranium exploration industry is facing. As a result of that exploration industry is facing considerable difficulty in raising new capital in the market. However, review of the project area shows that it has the most prospective tenement package in the region, and provides an advantage over competitors for both prospectivity and area wise. Exploration programs conducted, to date, has delineated substantial paleochannel system with high grade uranium mineralisation at shallow depth, which is expected to increase its size with further drilling. High resolution geophysical data have successfully delineated paleochannel system which requires drill-testing. It is highly likely that with further exploration, Afghan Swan uranium deposit will grow in size and new areas of uranium mineralisation of economic grade will be discovered. Therefore, it is suggested that company should keep on negotiating with interested investors to raise capital for exploration programs. Long-time uranium price appears to be positive because it is the only fuel which has the zero emission and combat greenhouse effects. Furthermore, it can produce electricity cheaper than fossil fuel and can meet ever-rising energy demand cost-effectively.
9.0 REFERENCES


