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SUMMARY

Pacific Exploration Pty Ltd (“Pacific”) acquired JINKA mineral tenement EL 29588 in southeastern Northern Territory for exploring mineral resources, such as uranium, gold, copper, lead, zinc and other metal minerals, as well as phosphate. The EL 29588 was granted to Pacific Exploration Pty Ltd on 19 February 2013 for a period of six years. The historical exploration tenements in this area were granted to explore for gold, base metals, nickel, uranium and other commodities.

The EL 29588 was located along the Plenty Highway, approximately 340km northeast of Alice Springs. Since its grant, Pacific has carried out two ground reconnaissance trips to the EL 29588.

This first annual report summarizes all information for future exploration activities carried out during the life of the tenements as required by NTGS.

The tenement (EL 29588) is underlain by basement rocks of the Aileron Province, Arunta Region, comprising greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865-1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north. This area has the potential to host metal (e.g., Mo-W, Au) mineralisation developed in the granitic and metamorphic rocks, as well as scarn formation.

Exploration during the reporting period comprised ground reconnaissance trips to locate and sample the surface geology and nearby known mineral occurrences. The desktop study of EL 29588 for mineral exploration has been focused the overview and technical proposal of the geological, geophysical and tectonic setting. This preliminary geoscientific study aims to investigate the geophysical and geological expression of structures related to any mineralisation. These studies will assist exploration in the Jinka region and provide fundamental data for increasing knowledge of geological processes and landscape evolution within this region.
1. INTRODUCTION

1.1 Background

PACIFIC EXPLORATION PTY LTD (“Pacific”) acquired a mineral exploration tenement EL 29588 in southern Northern Territory and is developing the JINKA Exploration Project (Figure 1.1). The licenses were granted on 19 February 2013 for a period of 6 years. Geometrically, these tenements are located within the Arunta Region, associated with the Reynolds, Yalyirimbi and Strangways Ranges. The schedule of rent and expenditure for the tenement EL 29588 is summarised in Table 1.1.

Table 1.1 Pacific Exploration Pty Ltd Tenement EL 29588 Schedule.

<table>
<thead>
<tr>
<th>Tenement ID</th>
<th>Tenement ID Expires</th>
<th>1st Year Rent</th>
<th>1st Year Expenditure</th>
<th>2nd Year Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 29588</td>
<td>19/02/2013</td>
<td>$2560.00</td>
<td>$22,000</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

Molyhil is a magnetite-rich skarn that has a bulls eye shaped aeromagnetic anomaly associated with it (Stewart, 2008). Previous exploration has suggested that aeromagnetic anomalies over the EL 24392 represent similar magnetite skarn bodies to that found at Molyhil to the west of EL 24392 (Stewart, 2008).

EL 29588 is located within the eastern Arunta region of the NT on the Huckitta 1:250K map sheet. Locally the geology contains a W-NW trending sequence of high grade metamorphic and granitic rocks, Elua Range sediments and cross cutting Oorabra quartz reefs (with occurrences of barite and fluorite). Basement rocks of this area of the Arunta region have been explored for Au, W, Mo and base metals.

A desktop study compiled by Pacific Exploration Pty Ltd aims to investigate mineral potentials. Recommendations for the comprehensive prospectivity and exploration techniques have been provided. The interpretation of the remote sensing, magnetic, gravity and morphology, based on the current data, thus formed a basis for mineral exploration in the JINKA exploration project area, and further investigation into the geomorphology, geology, geochemistry and geophysics of the project area and associated mineralization is necessary.

1.2 Location, Access and Logistics

The tenement EL 29588 is located along Plenty Highway, approximately 340 kilometres northeast of Alice Springs and 1000 kilometres south-southeast of Darwin by the Stuart Highway - Plenty Highway in the southeastern part of the Northern Territory of Australia (Figure 1.1).

Alice Springs (pop. 27,000) is well serviced by road transport and interstate bus services, because of its location mid-way between Adelaide and Darwin. The Stuart Highway and Adelaide-Darwin transcontinental railway corridor, passing through Alice Springs, bisect the area. Alice Springs is also serviced daily by jet aircraft from several
Australian capital cities (Sydney, Adelaide, Perth and Darwin) and less regularly from Brisbane, Cairns and Broome.

Figure 1.1 Regional Location Map showing “Pacific” JINKA exploration project area. EL 29588 is located in the eastern part of the map.

Alice Springs is the closest services centre, 340km by road via the Stuart Highway - Plenty Highway. The Aileron Roadhouse, located on the Stuart Highway with fuel and accommodation, lies 80km by road north of junction of The Stuart Highway and Plenty Highway. The nearest station is Jinka in the east part of the EL 29588.

1.3 Climate and Vegetation

The region has a semi-arid continental climate, characterised by long hot summers when temperatures regularly exceed 40°C, and short mild winters (Stewart, 1982). The
average rainfall is about 280mm, most of which falls between October and March, but both frequency and amount are erratic.” (Stewart, 1982).

The majority of the tenement is covered by various thicknesses of regolith cover and acacia trees and bush / grass undergrowth (Figure 1.2).

Vegetation throughout most of the area consists of tall mulga open shrubland with a woollybutt open grassland understorey. This gives way in the northwest to hummocky grassland with a tall acacia sparse shrubland overstorey” (Wilson et. al., 1991).

Figure 1.2  Photo imagery of EL 29588 showing granitic outcrops, regolith cover and acacia trees and bush / grass undergrowth (photo taken in January 2014).

1.4 Topography and Drainage

The area of the EL 29588 comprises a flat sandy plain rising gently northwards from around 350m ASL to around 400m ASL at the base east of the Elua Range (Figure 1.3). Elevations in the northern Elua Range exceed 520m ASL. Creeks that rise in the ranges and discharge into the area include Plenty and Marshall Rivers (Figures 1.1 and 1.3).
Figure 1.3 Landsat ETM7 realistic_247 over DTM imagery showing relationships of landscapes, roads, drainages, and locality and “Pacific” JINKA exploration project EL 29588.
2. PREVIOUS EXPLORATION

Previous exploration in the Jinka region has focussed on the potential of the basement rocks to host intrusions and metamorphic rocks containing Au, Mo, W and scarn (Table 2.1).

A review of the historical exploration conducted over and near EL 29588 was completed by identifying the historical tenement that overlapped with the current tenement (Figure 2.1).

Table 2.1 Summary of Historical Tenements in and near the EL 29588 Area.

<table>
<thead>
<tr>
<th>Historical Tenement</th>
<th>Company</th>
<th>Granted</th>
<th>Activity</th>
<th>Overlaps/ nearby</th>
<th>Commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL23087</td>
<td>Olympia Resources Ltd</td>
<td>2005</td>
<td>Mapping, soil sampling, reconnaissance drilling.</td>
<td>EL 29588</td>
<td>Au, Garnet sands, Uranium and others</td>
</tr>
<tr>
<td>EL 24392</td>
<td>Thor Mining PLC</td>
<td>2005</td>
<td>Ground magnetometer survey, interpretation and drilling.</td>
<td>EL 29588</td>
<td>Skarn formation and Mo-W mineralisation, base metals, diamonds</td>
</tr>
<tr>
<td>EL 26081</td>
<td>Matilda Minerals</td>
<td>2005</td>
<td>No on-ground exploration.</td>
<td>EL 29588</td>
<td>Uranium</td>
</tr>
<tr>
<td>EL 4677</td>
<td>BHP Minerals</td>
<td>1984</td>
<td>Aerial magnetic surveys, Ground magnetic surveys, Diamond drilling</td>
<td>EL 29588</td>
<td>Plenty River Prospect</td>
</tr>
<tr>
<td>EL 2774</td>
<td>Petrocarb Exploration / Geopeko/ Auttura Exploration / Peko Wallsend Operations</td>
<td>1982</td>
<td>Desktop study, review of earlier aeromagnetic surveys</td>
<td>EL 29588</td>
<td>Wolframite Molybdenum Skarn Scheelite</td>
</tr>
<tr>
<td>EL 6326</td>
<td>Geopeko/ Auttura Exploration / Peko Wallsend Operations</td>
<td></td>
<td>Ground radiometric traverses</td>
<td>EL 29588</td>
<td>Apatite, monazite</td>
</tr>
<tr>
<td>EL 603</td>
<td>Central Pacific Minerals</td>
<td>1972</td>
<td>Diamond drilling</td>
<td>EL 29588</td>
<td>Fluorite, scheelite, Base metals, Wolframite Copper Granite Pegmatite Skarn Mineralization</td>
</tr>
<tr>
<td>EL 10214</td>
<td>Arafura Resources</td>
<td>2002</td>
<td>no exploration</td>
<td>EL 29588</td>
<td>Uranium, Nickel, Copper, base metals</td>
</tr>
</tbody>
</table>

EL 23087, 2005 -Olympia Resources
This final surrender report summarizes all exploration activities carried out during the life of the tenements as required by NTGS. There were no promising results and any significant results.

**EL 24392, 2005 - Thor Mining PLC**

In December 2005, Sunsphere completed a 2 week, 1 man, and 25 m x 200 m ground magnetic survey over the regional NT aeromagnetic anomaly. The aim of the survey was to confirm the location of the regional anomalies and to carry out a depth to source interpretation of the magnetic bodies. Work completed (ending 4th December 2006) included ground magnetometer survey, interpretation and drilling. The magnetite occurrences were also confirmed by higher magnetic susceptibility readings. The drilling targeted shallow to deep magnetic anomalies that may have been related to skarn formation and Mo-W mineralisation. The follow-up drilling results show that no significant intersections were returned. The highest tungsten result was 4m at 60ppm, nearly all tungsten results were below 10ppm. The highest Mo result was 5ppm. Both of these were recorded in TCR49 recorded 11m of magnetite-biotite rich rock. No significant mineralisation was discovered.

Second year exploration comprise mapping, soil and rock chip sampling, and a geophysical interpretation of the recently completed NTGS Huckitta Gravity survey. In July 2011 a reconnaissance survey trip was undertaken to the Ultra Violet prospect to determine the logistics for undertaking a small scale drilling program to test the potential for tungsten mineralisation. In summary the geochemistry survey failed to detect any anomaly over the Ultra Violet Prospect. Drilling results indicated that no mineralisation was identified in the logging.

**EL 26081, 2005 - Matilda Minerals**

The exploration rationale for EL26081 is based on its location in the eastern Arunta, an area of high prospectivity for a variety of minerals including Cu-Ag-Pb- Zn deposits, W-Mo vein deposits, Sn-Ta-W vein deposits and uranium (Figure 2.1).

**EL 4677, 1984 - BHP Minerals**

Following geophysical surveys (Aerial magnetic surveys and Ground magnetic surveys); the diamond exploration for targeting magnetic anomalies kimberlite was failed.

**EL 2774, 1982 - Petrocarb Exploration / Geopeko/ Auttutra Exploration / Peko Wallsend Operations**

Geophysical surveys (Aerial magnetic surveys Aerial radioactivity surveys), geochemical surveys, percussion drilling and rock chip sampling have been applied for testing geophysical anomalies for targeting scheelite, molybdenite, magnetite, chlorite and Skarn mineralisation. The anomalies tested resulted from disseminated magnetite in gneiss, schist or calc-silicate. The remaining prospectivity is only in the vicinity of the Delny Sainthill Fault Zone.
Figure 2.1 Historical tenements in and near the EL 29588 Area.
3. GEOLOGY

3.1 Regional Geology

EL 29588 occurs in the eastern part of the Arunta region of the North Australian Craton (Figure 3.1), a sequence of predominantly metamorphosed sediments now represented by a series of micaaluminium silicate rich schists and gneisses, cut by a complex network of regional and local scale EW and NW–SE anastomosing faults (Figure 3.2).

Figure 3.1 Geological Regions of the Northern Territory and “Pacific” YAMBAH and JINKA (EL 29588) projects.

In the Jinka-Jervois area, EL 29588 is predominantly underlain by unnamed metamorphic, assigned to the Strangeways Metamorphic Complex (Huckitta 1:250,000 explanatory notes, NTGS 1986). These metamorphic occur as isolated outcrops surrounded by extensive soil and sand-covered plains. The dominant rock type is quartz-feldspathic gneiss and commonly grades into biotite-rich gneiss. Migmatite occurs in both rock types. Feldspathic quartzite and schistose, mica-bearing quartzite are also present and frequently contain tourmaline. Other rock types include biotite schist, layered magnetite-quartz rock,
calc-silicate rocks, and megacrystic granitic gneiss. The rocks are intruded by several plugs of unnamed granite. Schistose biotite-garnet gneiss, sillimanite gneiss, amphibolite, and biotite gneiss of the “Iridina Gneiss” also occur in the area.

To the south, the rocks of the North Australian Craton pass into the Central Australian Mobile Belts of the Proterozoic Orogens of the Arunta Region and Musgrave Block, consisting of granulite and amphibolite facies, metamorphosed sediments and mafic volcanics intruded by granitoids. In the southern Arunta Province, episodic igneous activity took place between 1880-1050 million years and deformation included a series of major tectonic events, including retrogressive metamorphism in the Proterozoic and Palaeozoic.

Proterozoic-Palaeozoic basins form part of the North Australian Platform Cover and comprise mildly deformed, largely unmetamorphosed predominantly sedimentary successions unconformably overlying the Proterozoic Orogens (Davey, 2012). This includes the Ngalia and Georgina Basins in the Aileron region. These rocks are absent in the Jinka project area.

A system of major west-northwest, east northeast and north-northeast trending dipping thrust faults and shear zones affects the Arunta Region. The associated shear zones can be up to hundreds of metres in width and extend for several kilometres, and are thought to have formed during the 400-300 Ma Alice Springs Orogeny (Cartwright et al., 1999). EW and NW–SE structures underlie the Jinka-Jervois region (Figure 3.2).

Pre-Cambrian-Proterozoic

The basement rocks in the Aileron region comprise part of the Arunta Region, a complex basement inlier in central Australia that has undergone a prolonged history of sedimentation, magmatism and tectonism extending from the Palaeoproterozoic to the Palaeozoic (NTGS the website, December, 2004). The Arunta Region can be subdivided into the three, largely fault bounded terranes with distinct geological histories: the Aileron, Warumpi and Irindina Provinces (Figure 3.1).

3.2 Local (EL 29588) Geology

The geology is illustrated by the Huckitta 1:250,000 geological mapsheet (Figure 3.2).

Pre-Cambrian-Proterozoic

The EL 29588 is underlain by basement rocks of the Aileron Province (Figure 3.1). The Aileron Province comprises greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865 Ma -1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north. In contrast, the Warumpi Province comprises amphibolite to granulite facies rocks with protolith ages in the range 1690 Ma -1600 Ma, and is interpreted to be an exotic terrane that accreted to the southern margin of the North Australian Craton at 1640 Ma. The Irindina Province in the Harts Range region comprises Neoproterozoic to Cambrian metasediments that formed in a major depocentre within the Centralian Superbasin. It
underwent high-grade metamorphism and deformation during Ordovician (480 Ma - 450 Ma).”

Basement geology is dominated by quartzofeldspathic gneiss of the Strangways Metamorphic Complex, which has been assigned by the Northern Territory Geological Survey (NTGS) and TENL to the basal (>1870 Ma) Narwietooma Metamorphics.

Figure 3.2 Regional geology (Huckitta as well nearby 1:250,000 geological mapsheets) showing relationships of major faults, geology, landscape and “Pacific” Jinka project EL. EL 29588 is located in the central part of the map.

The Arunta Basement in this region is further subdivided into the Central and Southern Provinces by the Redbank Thrust Zone, a major north dipping crustal-scale northwest trending structure.
Cainozoic Geology

Due to lack of stratigraphic drillhole information in the Jinka project area, the knowledge of the distribution and extent of the Cainozoic has been largely gained through accidental intersections in water bores or in drillholes seeking mineralisation under cover (Davey, 2012). In the west of EL 29588, the stratigraphy of the resource area of the proposed Aturga Mine is well documented by Doepel (2003) who identified and described the following geological units.

- River wash: Sands and gravel of the active channels of Aturga Creek and the Plenty River.
- Dunes: Fixed sand-dunes, up to 20m thick. They contain carbonate alteration and some lithification, especially towards their base.
- Swales: Between the dunes. They are finer-grained than the dunes and more strongly lithified.
- Floodplain deposits: Consolidated, but unaltered and un lithified, mostly from 1.5 to 4.5m thick.
- Palaeochannels: Older floodplain and river channel deposits unconformably beneath the floodplain, dune and swale units. They are lithified and subject to carbonate alteration.
- Tertiary Clay: tertiary clay unconformably underlies the above units. It is known from water bores in the area to be in excess of 100m thick in places. It is cream or green in colour, and contains minor sand grains. It is correlated with the Claraville Mudstone.

Garnet and AMH is found in all units with the exception of the Tertiary Clay. Coarse grained minerals are found in the river wash, floodplain and palaeochannels.
4. MINERALISATION

4.1 Source Rocks of Minerals

In this region, the basement rocks have been explored for Mo-W mineralisation, wolframite, nickel, copper, base metals, diamonds, scheelite, apatite, monazite, fluorite, scheelite, granite pegmatite, uranium, and skarn mineralization, and contain elevated background levels of uranium and thorium. The products of the weathering and erosion of these rocks throughout the Cainozoic have accumulated in palaeochannels as thick sequences of unconsolidated material and provided a potential host for the precipitation of uranium from solution in groundwater sourced from the upstanding ranges and percolating through these basal sediments.

4.2 Potential Mineralisation

Relevance to the “Pacific” tenement EL 29588 and surrounding areas the mineral potentials are the hard-rock hosted metals, and sandstone-hosted uranium mineralisation. Although the EL 29588 is not falled within the zone of regional uranium potential in the Northern Territory (Lally and Bajwah, 2006) (Figure 4.1), the known occurrences falling in the same geological domains suggest the potentials of such mineralisation in the Jinka project region (Figure 4.2).

![Figure 4.1 Uranium occurrences and areas with potential for uranium in the project region](from M Ahmad, NTGS, unpublished data).

The uranium fields of the Amadeus Basin and Ngalia Basin are associated with the project area, where the sandstone-hosted uranium mineralisation is reported from the Carboniferous Mount Eclipse Sandstone and Kerridy Sandstone Formations of the Ngalia
and Amadeus Basins (Figure 4.1). Sedimentary rocks of the Ngalia Basin were derived from, and deposited on felsic granite gneiss and schist of the Arunta Block which are significantly enriched in uranium. The Yulyupunya Granite Gneiss (1780Ma) and the Southwark Granite Suite, for example, contain up to 22.5ppm uranium (Young et al. 1995). Importantly as uranium reductant, carbonaceous material is also common with a 7m thick unit of lignite reported (Spark, 1975).

Figure 4.2 Uranium occurrences in the region [uranium occurrences shown in blue. Yellow: most recent exploration activity. Advanced or significant under developed occurrences shown with pickaxe (Northern Territory Government Report, March 2013)].

Importantly, a number of mineral prospects and occurrences mostly categorised as hard-rock and tectonic-type minerals are located in the north and west of the EL 29588, such as Ultra Violet Prospect (Figure 3.2).

The lack of geochemical signature derived from previous exploration activities over the EL 29588 area may have been as a result of the transported cover and the nature of soil sample taken rather than an indication that there were no metal mineralisations. As a result the detailed geophysical and drilling programs are still needed to be undertaken.
5. INTERPRETATION AND MINERAL PROSPECTIVITY

An assessment of the JINKA project for mineral deposits was to undertake a compilation of geological, geophysical, topographical and historical open file data over the tenement area and provide initial recommendations for ongoing exploration.

The current interpretation and discussion are mainly based on the associated public domain geophysical and geological data including, aeromagnetics, gravity, and DEM, surface and solid geologies for the project area was acquired from the NTGS. Reprocessing of the digital data has enhanced all of the geophysical and geological signatures and has also outlined a number of other subtle features.

5.1 Methodology

Topography (digital elevation models) and Landsat images, magnetic, and gravity methods are integrated into this phase on the basis of GIS for an attempt to correlate the features observed from geological maps. This interpreted result derived from the integrated datasets will be tested and improved by application of new drillholes.

All coordinates listed in this report are in map projection MGA94, Zone 53 (GDA94). The targeting process was undertaken as follows:

- Import of the above into ArcGis and sub-setting into different sample types and grade ranges for presentation and analysis.
- Examination of fact geology and surface geology and to provide geological information for targeting.
- Identification of available airborne geophysical and remote sensing data.
- Review of all data mentioned above to identify mineral targets.
- Identification targets with the potential to contain significant mineralisation.
- Recommendation of effective methods for exploring mineral deposits in the project area [Some useful methods (e.g., for mapping palaeovalleys) will be recommended].

**Topography – Digital Elevation Model (DEM)**

Topography over the tenement EL 29588 is relatively low and flat in the southern part and occurs higher towards the north, with two main creek systems across the southern part (Figure 5.1). Three main faults occur in the central part of the exploration licence EL 29588 (Figure 5.1).

Generally, DEM is very effective in the recognition of young (e.g., Cenozoic and/or Mesozoic) potential palaeochannel areas, as the lower topographic zones can reflect areas where some of the softer sediments have been eroded away. Therefore, DEMs can be used as surrogates for mapping the palaeochannels and related features when the modern and palaeo- geomorphologies are related spatially and genetically. This scenario should be
confirmed by combining other methods, such as night-time thermal imagery, AEM/TEM and drilling. If the presence of potential palaeochannels can be determined, some segments of the palaeochannels here should be favourable for exploring sandstone-hosted and/or calcrete style uranium deposits.

![Figure 5.1 Digital Elevation Model (DEM) over regional geology, showing relationship of EL 29588, geological regions and faults, mineral occurrences and drillholes.](image)

**Landsat TM**

Landsat TM image is useful in defining spectrally anomalous zones or regions when appropriately draped over DEM to enhance terrain visualisations (Figure 5.2). This can be used to figure out the relationship between the U-source rocks and in-situ uranium or U/Th anomalies, which is helpful in exploring for uranium mineralisation.
Total Magnetic Intensity (TMI)

Magnetic high features within the EL 29588 are interpreted as Fe-bearing metamorphic basement and fault images (Figures 5.3). The fault features are clearly defined by the total magnetic intensity data (Figures 5.4).

Likely, interpreted magnetite-rich skarn feature that has a bulls eye shaped aeromagnetic anomaly occur in the northern part of the EL 29588 (Figures 5.3 and 5.4). Previous exploration has suggested that aeromagnetic anomalies over the EL 24392 represent similar magnetite skarn bodies to that found at Molyhil to the west of EL 24392 (Figure 2.1).
Figure 5.3 Total Magnetic Intensity (TMI, GA data) of the EL 29588 area, showing EL 29588, faults, mineral occurrences and drillholes.

Mesozoic and/or Cainozoic paleovalleys are not usually visible on regional magnetic data (Figures 5.3 and 5.4), as they are relatively shallow features, but the magnetic high features of faults in the central part of EL 29588 indicate potentials of scarn and/or hard-rock mineralisation, such as copper, gold, nickel, and Mo-W mineralisation which need detailed surveys assist in locating relative deposits.
Relative high gravity feature occurs in the southern part of the EL 29588 area where shows a relatively high gravity feature (Figure 5.5). The known mineral occurrences are mostly associated with low and moderately high gravity features, which is similar to the features in the southern central part of the EL 29588.

Because of normally small scales of palaeovalleys, gravity method should use high resolution survey, especially when it used with DEM, Landsat, NOAA, or AEM images. Similar to the TMI imagery (Figures 5.3 and 5.4), the faults is also clearly defined by the gravity data (Figure 5.5).
5.2 Mineral Prospectivity

Relevance to the “Pacific” tenement EL 29588 and surrounding areas the mineral potentials are the hard-rock hosted metals, and sandstone-hosted uranium mineralisation. Regionally, the style of mineralisation in the Arunta Region gneisses and metamorphic sequences is represented by pegmatite/vein style mineralisation (Sn-Ta-W) and the Nolans Bore metasomatite flour-apatite style mineralisation (REE-P-U). In the southeastern of the Arunta Region, the basement rocks have been explored for Mo-W mineralisation, wolframite, nickel, copper, base metals, diamonds, scheelite, apatite, monazite, fluorite, scheelite, granite pegmatite, uranium, and skarn mineralization. The products of the weathering and erosion of these rocks throughout the Cainozoic have accumulated in palaeochannels as thick sequences of unconsolidated material and provided a potential host
for the precipitation of uranium from solution in groundwater sourced from the upstanding ranges and percolating through these basinal sediments.

Although the EL 29588 is located outside of the general region of uranium prospectivity (Lally and Bajwah, 2006) (Figures 4.1 and 4.2), it is still possible to explore for palaeovalley sandstone-hosted and calcrete style uranium mineralisation in this area as palaeovalleys probably developed during Cainozoic, similar to those found in the WA Yilgarn and SA Gawler cratons.

Surficial style uranium mineralisation related to palaeovalley and playa, or terrace deposits may not be developed in areas where significant calcrete and terrace deposits are absent, associated with the drainage system and possible palaeo-playa lakes.

A number of mineral prospects and occurrences mostly categorised as hard-rock and tectonic-type minerals are located in the north and west of the EL 29588, such as Ultra Violet Prospect (Figure 3.2).

The lack of geochemical signature derived from previous exploration activities over the EL 29588 area may have been as a result of the transported cover and the nature of soil sample taken rather than an indication that there were no metal mineralisation’s. As a result the detailed geophysical and drilling programs are still needed to be undertaken.
6. CONCLUSIONS AND RECOMMENDATIONS

EL29588 remains highly prospective for Mo-W, wolframite, nickel, copper, base metals, apatite, monazite, scheelite, granite pegmatite, uranium, and skarn mineralization, mostly hosted in the metamorphosed basement rocks and fault zones. High-resolution ground magnetic and gravity, shallow seismic, TEM, and test drilling, where necessary, are important media that can be used in subsurface structure delineation.

Uranium hosted in palaeochannel sediments is also another significant potential in the Jinka project area. The combination of DEM, AEM, and night-time thermal remotely-sensed imagery in GIS mode represent by far the best method for palaeovalley-related uranium exploration in the area. The detector and orbital configuration of NOAA-AVHRR (1.1 km pixel) and ASTER (90 m pixel) night time data could make it a very useful remote-sensing method in that it detects temperature variations in palaeochannel sediments related to the elevated moisture content of the channel. Microgravity surveying techniques can also be applied to look for uranium-bearing palaeochannels in the project areas; gravitational techniques should work quite well, given the density contrast of the basement/bedrock and the channel sand. The AEM has proven to be a good guide to conductive variations in the subsurface and is one of the best techniques for detecting buried conductive anomalies.

It is recommended that the exploration program in the next step should be designed to test the tenement for the mineral targets described above. In summary, the following conclusions can be made regarding the geophysical and geological methods for locating potential mineralisation sites:

- Acquires and interprets detailed night-time thermal image (first), AEM/TEM or shallow seismic data over the project area.
- An airborne electromagnetic (AEM) survey is recommended second as results may define smaller target areas and aid in orientating traverse lines correctly.
- If necessary, carries out high-resolution ground magnetic and gravity traverses over the magnetic anomalies with the generation of geology maps.
- Compiles a detailed structural map and analysis of all priority magnetic and radiometric anomalies to determine the controls and disposition of any uranium mineralisation potential.
- Look for signs of channels and intrusives at depth or zones of high physical contrasts along shear zones and or contacts that might mark high redox potential.
- To determine survey line orientation, lithology strike and dip needs to be determined for the palaeovalley and underlying basement.
- Test drilling should traverse across or along the interpreted signatures, and particularly high priority zones selected. When these predictions prove wrong, the information should be used to revise and update the 3D models.
- Conduct a small RAB/RC/diamond drill program targeted at down dip and down plunge extensions to the any mineralisation intersected and to test the source of the uranium conductors located by geophysical survey.
• RC drilling. The cost of drilling possibly 10-100m deep holes to reach the basement means a palaeovalley-related (sandstone and surficial-style) uranium deposit would need to be found.

• Sample water from aquifers intercepted by station bores to map U distribution.

• Any trace of valuable minerals within the basinal sediments or bedrocks (e.g., Au, W, Mo, Cu and U) is of interest as a guide to the location of basement mineralisation.
KEY REFERENCES


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APPENDIX 1 – EXPENDITURE REPORT