

**PARTIAL RELINQUISHMENT REPORT
ON EAST ALICE SPRINGS PROJECT**

**AMADEUS BASIN MINERAL FIELD,
NORTHERN TERRITORY**

East Alice Springs Project

Exploration Licence: 26551

BY

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DISTRIBUTION

1. *Northern Territory Department of Minerals & Energy*

PROJECT NAME:	EAST ALICE SPRINGS		
TENEMENTS:	Exploration Licences 26551		
MINERAL FIELD:	Amadeus Basin Mineral Field		
LOCATION:	ALICE SPRINGS	SF5314	1:250 000
	Undoolya	5750	1:100 000
	Fergusson Range	5850	1:100 000
COMMODITIES:	Base Metals, Uranium, Manganese, Iron and Phosphate		

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1.0 EAST ALICE SPRINGS PROJECT

2.0 INTRODUCTION

The East Alice Springs project is located approximately 850 road kilometers east of Alice Springs Township on the Alice Springs in the Northern Territory (Figure 1) Access to the Exploration Licence area is provided by the Ross Highway and graded road suitable for most traffic in the dry season while bush tracks on the alluvial plains give reasonable access within the Exploration Licence. The project comprises one granted Exploration Licence (EL 26551) which covers a total area of 350.6 km²

This report describes the results of literature research and target generation based on re-interpretation of magnetic/radiometric data carried out during the first year of the Licence.

In 1974, percussion drilling by Dampier intersected two horizons of phosphatic calcareous, silty shale. Drill Hole RR1 intersected **2m of 4.30% P₂O₅** and **6m of 22.80% P₂O₅**. The section of Todd River Dolomite intersected in RR1 and RR2 comprises dominantly calcareous siltstone and sandstone, phosphatic in part and minor dolomitic limestone. The drill holes coincided with the radiometric anomalies.

In 1992, CRA Exploration Pty Ltd completed surface geochemical surveys. The rock chip sampling of representative stratigraphy within the anomalous drainage catchments were follow up by rock chip sampling. Traversing of the anomalous drainage catchments in general did not define any elevated base metals geochemistry. However, highly elevated iron and manganese (max of 23.6% and 17.6% respectively) often correlated with anomalous Cu & Zn. Abundant signs of manganese anomalism were observed.

During the 2011, a review of re-processed and re-interpretation of magnetic and radiometric data from the Northern Territory Geological Survey Database was undertaken. The geophysical images were processed by Asis International Pty Ltd for use in identifying exploration targets for uranium, base metals and phosphate.

A total of 50% of the tenement was to be relinquished based upon more favorable radiometric targets in the eastern portion of the Exploration Licence area.

3.0 LOCATION AND ACCESS

Exploration Licence Application 26551 is situated approximately 50 road kilometers east of Alice Springs Township on the Alice Springs 1:250,000 geology sheet. Access to the Exploration Licence area is provided by the Ross Highway and graded road suitable for most traffic in the dry season while bush tracks on the alluvial plains give reasonable access within the Exploration Licence.

Bouldery and rugged terrain typical of large outcrops of granite limit access to four wheel drive or foot traffic for most of the area. Little natural surface water is available for much of the year, and stock is watered from several large dams and bores.

4.0 TENEMENTS

The project is comprised of one granted exploration licence (EL) with the tenement details summarised in Table 1 and their locations are shown in Figure 1.

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Table 1: East Alice Springs Project – Partial Relinquishment Tenement Summary

Project	Tenement Number	Status	Current Area		Current Holder	Granted Date	Expenditure Covenant (\$)
			Blocks	(sq km)			
East Alice Springs	EL26551	Granted	28	88 km ²	Bluekebble Pty Ltd	28/8/2008	\$22,000

The whole Exploration Licence area falls within the Perpetual Pastoral Lease 0980 and 0995 under the control by Hayes, James Alexander and Inwemanthwererre Aboriginal Corporation.

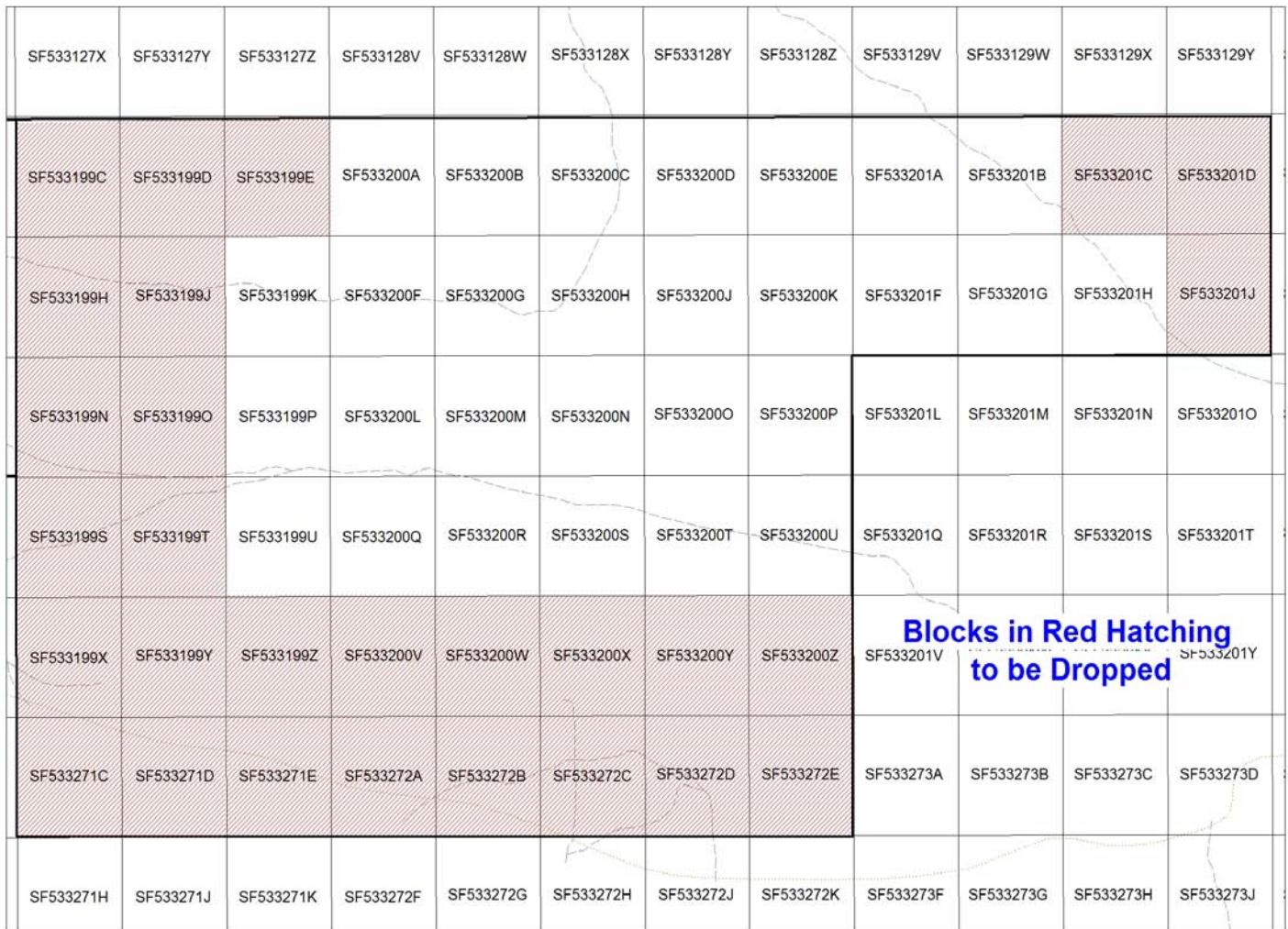


Figure 1: East Alice Springs Project – Areas to be Relinquished Map

5.0 REGIONAL GEOLOGY & MINERALISATION

Descriptions of the geology and evolution of the Amadeus Basin are given in Wells *et al* (1967, 1970), Shaw and Wells (1983), Lindsay and Korsch (1991) and Shaw and Warren (1995). Korsch and Kennard (1991) consist of a collection of papers discussing various aspects of the basin in more detail. As in the Ngalia Basin, sediments range in age from Neoproterozoic to Carboniferous, and

were deposited on and derived from rocks of the Southern Arunta Province.

In the north eastern Amadeus Basin, the Lower Cambrian Todd River Dolomite comprises dominantly pink and grey thick-bedded fossiliferous dolomite. At the base are calcareous red-brown thin-bedded dolomites, sandstone and siltstone transitional to the underlying Arumbera Sandstone. The unit is overlain by the Giles Creek Dolomite and Chandler Limestone within the Pertooorta Group. BMR mapping measured the Todd River Dolomite as thickest at the Ross River George Section in the Ferguson Syncline (270m) thinning to the west to the Ooraminna Anticline which is the most westerly outcrop. Large areas of low dipping Todd River Dolomite outcrop at Phillipson Pound and the Ooraminna Anticline.

Sandstone of the Undandita Member of the Brewer Conglomerate host uranium mineralisation in the Amadeus Basin. Brewer Conglomerate is the youngest preserved unit in the basin and lies at the top of the Pertnjara Group, which are thick succession of Late Devonian terrestrial sediments. The Pertnjara Group was deposited in a foreland basin that developed at the front of a south-moving thrust wedge of Southern Arunta Province rocks (Lindsay and Korsch 1991). Clastic sediments were sourced from progressively older rocks as erosion of the foreland continued. Source rocks for the Brewer Conglomerate included high-uranium granitic orthogneiss of the Iwupataka Metamorphic Complex and the Teapot Granite Complex.

Brewer Conglomerate is composed predominantly of polymictic conglomerate with minor pebbly sandstone and occurs as a south-thinning wedge. Lithic sandstone, pebbly sandstone, siltstone and conglomerate of the Undandita Member lies above and south of Brewer Conglomerate. The grain size of the Undandita Member sandstone decreases upwards to fine to coarse arenite, or arkose interbedded with thin mudstone layers. Undandita Member sandstone is generally oxidised, but it contains a wedge of reduced sediments between regionally extensive upper and lower redox boundaries (Borshoff and Faris 1990). Pertnjara Group rocks were deformed into gently doubly-plunging, east-trending upright open folds. Known uranium deposits and prospects lie on the southern limb and eastern closure of one such fold, named the Missionary Syncline.

The Amadeus Basin hosts commercial petroleum fields at Mereenie and Palm Valley and has significant potential for further discoveries. The basin also contains gold, evaporites and sandstone-type uranium deposits, and a number of small base metal occurrences.

Sandstone-type deposits are restricted to Palaeozoic (Devonian-Carboniferous) continental red-bed sedimentary successions in the Ngalia and Amadeus basins. Deposits of this type represent about 5% of uranium resources in the NT. Uranium mineralisation occurs at a redox boundary that formed either by flushing oxidising groundwater through reduced sandstone beds (Amadeus Basin deposits), or by interaction with detrital organic matter (Ngalia Basin deposits). *Angela*, in the Amadeus Basin, is the largest deposit of this type and contains 10,250 t U₃O₈ grading 0.1% U₃O₈.

6.0 PREVIOUS EXPLORATION PROXIMAL TO EL 26551

6.1 Angela Uranium Deposit (SW of EL 26551 approx 55 km)

Angela is located 25 km south of Alice Springs and the minor occurrence Pamela is 4 km north of Angela. UAL located a diffuse airborne radiometric anomaly south of Alice Springs in 1972, which was confirmed by ground radiometrics (Borshoff and Faris 1990). Trenching and drilling in 1973-74 led to the discovery of mineralisation at Angela and Pamela and their association with redox boundaries in the Undandita Sandstone. Detailed drilling in 1975-1979 found a number of mineralised bodies subordinate to the main deposit at Angela I, which were designated Angela III to V. Deep drilling at Angela I in 1980-81 confirmed a strike length exceeding 5.7 km, with

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mineralisation open down-plunge to the west. Maximum total resources within Angela I-V are 12,650 t U₃O₈ in material grading 0.1 % U₃O₈.

Mineralisation is associated with gently north dipping upper and lower redox boundaries within medium to coarse grained feldspathic lithic sandstone of the Undandita Member. Both upper and lower redox boundaries can be mineralised, but concentrations are generally higher on the upper boundary. On a regional scale the redox boundaries are planar, but at the prospect scale they step across bedding to higher or lower stratigraphic levels. This stepping is controlled by permeability contrasts between different layers in the Undandita Sandstone.

Higher grade mineralisation at Angela I defines a linear zone 70-250 m wide that coincides with a complex 30-40 m high step zone on the upper redox boundary. This step zone strikes east and plunges 9° west, and may be related to a small fault parallel to the axial plane of the Missionary Syncline. In detail, the mineralised zone consists of a series of stacked horizons, which consist of one or more small uranium roll-fronts.

Primary uranium mineralisation consists of poorly crystalline uraninite and pitchblende with minor coffinite, occurring as grain coatings, void linings and blebs. The bulk of the mineralisation is fine-grained or amorphous. Secondary minerals include carnotite, autunite, tyuyamunite and metatyuyamunite. Gangue minerals are mainly fine-grained to amorphous hematite, (occurring as grain coatings and matrix filling), calcite, minor pyrite and organic material. Pamela lies at the northeastern end of the reduced sandstone facies wedge, where the steps and irregularities on the upper and lower boundaries meet to form a sequence of alternating oxidised and reduced sandstones. Although multiple redox boundaries and step zones up to 50 m thick are present, mineralisation is thinner, weaker and less continuous than that at Angela, with no zone of enrichment being recognised that may continue down dip.

Table 2: RESERVE CLASS (in t U₃O₈)

Orebody	Indicated Reserves	Inferred	Potential
Angela I (Depth)	4,200 (to 450m)	1,500 (450-650m)	1,500 (650-800m)
Angela II + Areas between I + II) (Depth)	500 (to 450m)	450 (200-450m)	1,000 (450-800m)
Angela III + IV + V (Depths)			3,000 (to 800m)
Total in tonnes	4,700	1,950	5,500

7.0 PREVIOUS EXPLORATION WITHIN EL 26551

In 1974, Broken Hill Propriety Co Ltd during testing for base metal mineralisation within the Todd River Dolomite, percussion drilling by Dampier intersected two horizons of phosphatic, calcareous silty shale. In drill hole RR1, 2m @ 4.30 P₂O₅ from 36m and 6m of 22.80% P₂O₅ from 52m were intersected with the Arumbera Sandstone.

In 1992, CRA Exploration Pty Ltd completed surface geochemical surveys which included the

following;

1. 60 gravel samples (approx 20 km²) for the purpose of diamond exploration
2. 277 stream sediment samples (approx 1.5 km²) for the purpose of base metal exploration
3. 40 rock chip samples for the purpose of gold and base metal exploration

The gravel samples survey returned only one sample with kimberlitic indicator minerals which was believed to be of a non-kimberlitic origin. No follow up was recommended. The stream sediment sampling programme outlined several coherent, low order (max 64 ppm Cu and 460 ppm Zn) copper dominated and Zn+Cu+Mn dominated anomalous drainage catchment were defined. The majority of the Cu dominated anomalies occur within flat-lying Arumbera Sandstone in the south-east of the Ooraminna ranges tenements with the remainder of the anomalies, primarily centered on the limbs of the Ross River and Fergusson Synclines.

The rock chip sampling of representative stratigraphy within the anomalous drainage catchments were follow up by rock chip sampling. Traversing of the anomalous drainage catchments in general did not define any elevated base metals geochemistry. However, highly elevated iron and manganese (max of 23.6% and 17.6% respectively) often correlated with anomalous Cu & Zn suggesting effective scavenging of the labile elements.

No indications of copper mineralisation, alteration and/or sulphide development was observed in the survey, supporting the low tenor of base metal geochemistry reported in the rock chip sampling.

In contrast to the copper geochemistry, abundant signs of manganese anomalism were observed. This was manifested in many forms, primarily as:

1. Mn staining on fracture planes
2. Secondary remobilization of Mn developed over carbonate lithologies
3. Fe/Mn segregations formed within a resistive and silicified layer concordant to bedding within the lower units of the Arumbera Sandstone

8.0 WORK COMPLETED AND DISCUSSION

During the term, the work was restricted to a study of open files available at the Northern Territories Department of Mines & Energy. The open file study demonstrated that there was some significant potential for uranium, base metals and phosphate in the area. In February 2009 Kastellco Geological Consultancy Ltd (KGC) was contracted to conduct a desktop study over the area and to make recommendations on a follow-up exploration programme for the following year.

During the month of March 2011, a review of re-processed and re-interpretation of magnetic and radiometric data from the Northern Territory Geological Survey Database was undertaken. The geophysical images were processed by Asis International Pty Ltd for use in identifying exploration targets for uranium, base metals, tungsten and tantalum. Several first-order and second-order radiometric targets were identified which had not been previously examined by historical field programmes. Historical regional data was also reviewed to determine the effectiveness of previous exploration and evaluate remaining potential.

A summary of the relinquished radiometric targets is presented in Table 3 and illustrated respectively in Figure 2. The targeting was undertaken at a high level to identify areas of interest that stand out in the regional data.

Historical prospects were reviewed to determine the effectiveness of the previous exploration and evaluate remaining potential.

Table 3 - Exploration targets (Radiometric derived)

Order	Quantity	Anomaly length (km)	Anomaly width (km)	Geological Setting	Mineralisation model
Radiometric Anomalies					
Second/Third Order	1	Max – 2.34 km	Max – 0.41 km	Goyer Formation	Pegmatite/vein hosted related uranium deposit
Second/Third Order	1	Max – 10.40 km	Max - 0.84 km	Arumbera Sandstone	Unconformity hosted related uranium deposit

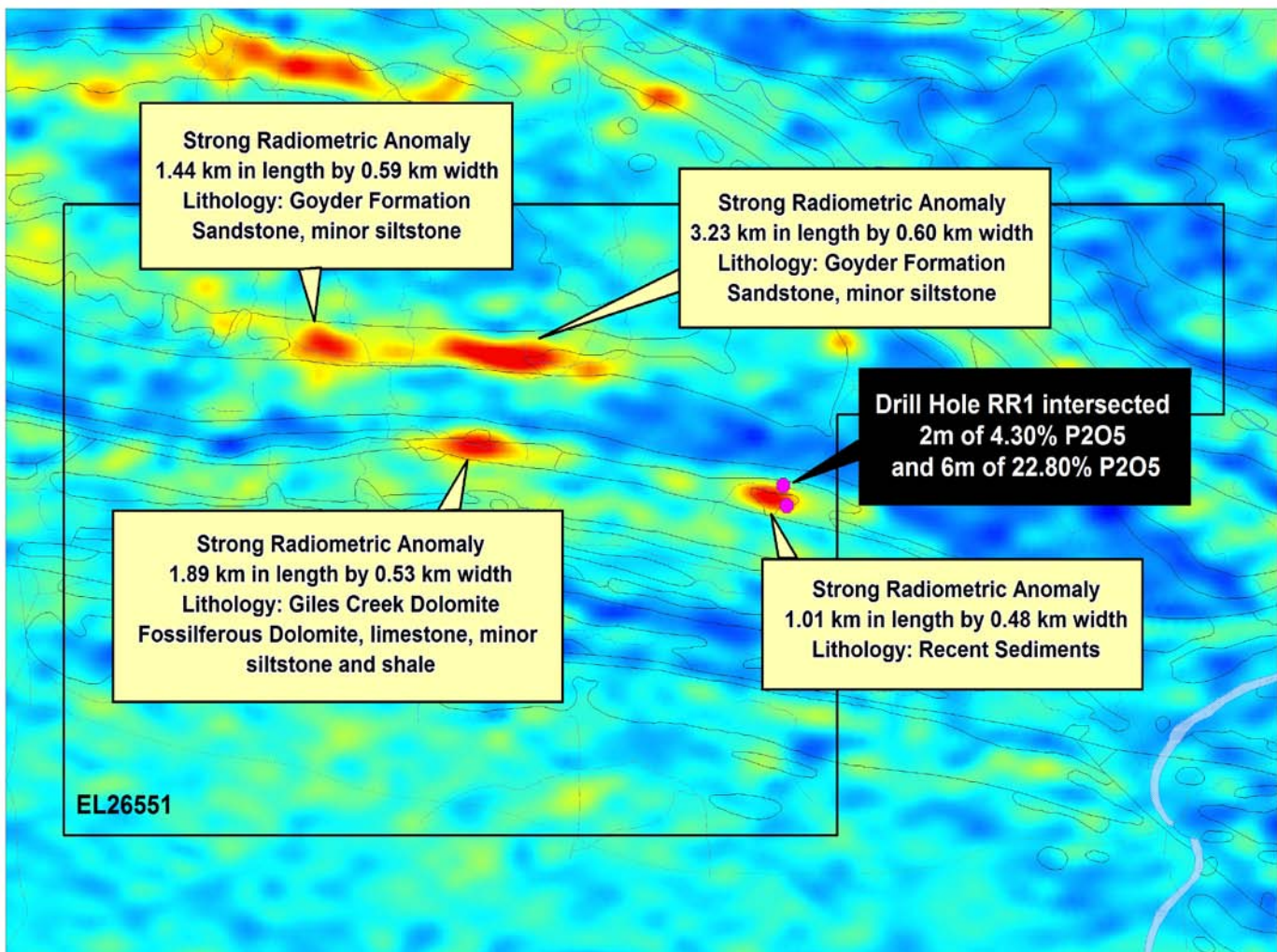


Figure 2: Regional Equivalent Uranium (ppm) Image showing the Radiometric Target Areas within the new area

9.0 REFERENCES

Dunphy M.C., CRA Exploration Pty Ltd 1992 – Final Report on EL 7335 Mt Benstead & EL 7429 Ooraminna Ranges for the period ending 04/06/1992 Open File Report, DME CR1992/0484.

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BHP Pty Ltd 1976 – Final Report on EL 1064 Ooraminna Northern Territory, Open File Report, DME CR1973/0073.