

# EL 25367 Final Report

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## **Appendices – Digital Data**

Data	File Name
Report	EL25367_2011_F_01_Report.pdf
Surface XRF Geochemistry	EL25367_2011_F_02_SurfaceXRFGeochem.txt
Drill Collars	EL25367_2011_F_03_DrillCollars.txt
Downhole XRF Geochemistry	EL25367_2011_F_04_DownholeXRFGeochem.txt
Downhole Geochemistry	EL25367_2011_F_05_DownholeGeochem.txt
Lithology Logs	EL25367_2011_F_06_Lithologylogs.txt
Lithology Codes	EL25367_2011_F_07_LithologyCodes.pdf
VTEM	EL25367_2011_F_08_VTEM.zip
Gravity	EL25367_2011_F_09_Gravity.zip
Gravity	EL25367_2011_F_10_Gravity.zip

## SUMMARY

Uramet Minerals Limited identified the potential for a calcrete-hosted uranium occurrence within the Wilora palaeo-channel located approximately 180 km north of Alice Springs, NT. Potential for stratiform copper mineralisation and sandstone-hosted lead mineralisation in the Mt Skinner area has also been recognised (Dunster et al., 2007).

This report details exploration work carried out by Uramet Minerals Limited within EL25367 between 21 February 2007 to 13 January 2011.

The tenement which was originally held by Elkedra Diamond NL was transferred to Uramet Minerals Ltd during the 2007 season. The original size of the tenement was 413 blocks, covering an area of 1,284 km<sup>2</sup>.

Exploration consisted of regional reconnaissance work; aircore drilling and geochemical analysis of rock chip and drill spoil samples. A helicopter-borne electromagnetic (EM) survey took place over the southeast part of the tenement in October 2007 with final data products to be supplied in early 2008.

Regional field reconnaissance was carried out in July and October 2007 with promising anomalous copper and uranium results returned. A previously geophysically-defined fault zone was identified in the field.

An extensive aircore drilling program within the Wilora palaeo-channel and a minor reconnaissance drilling in the Mt Skinner area was completed during the reporting period. A total of 114 holes for 1872m were drilled within the tenement in September and October 2007. The drilling revealed an extensive uranium anomaly bordering on the western edge of the tenement with the best intersection within EL 25367 of 102 ppm uranium measured with a handheld XRF.

# 1. Introduction

Exploration License EL25367 covers the Uramet Mineral Limited's Wilora palaeo-channel uranium and Mt Skinner base-metal project areas located approximately 200 km north of Alice Springs, NT. Access to and within the tenement is good, with the sealed Stuart Highway and a network of established minor roads and station tracks. The tenement is also crosscut by the Alice Springs-Darwin railway line (Figure 1).

An Aboriginal Areas Protection Authority (AAPA) clearance was conducted in the western part of the tenement prior to field work and any area of cultural significance was avoided.

This report details all exploration work (targeting calcrete hosted uranium and base metals) carried out on the tenement between 21 February 2007 and 13 January 2011 by Uramet Minerals Limited.



Figure 1. Location map of EL25367

## 2. Tenure

EL25367 was granted to Elkedra Diamonds on 21 February 2007, then transferred to Uramet Minerals Limited during 2007. The original size of the tenement was 413 blocks, covering an area of 1,284 km<sup>2</sup>.

Obligatory 50% reductions were made as required, with the tenement being surrendered in full on 13 January 2011.

# 3. Geology

## 3.1 Regional Geology

The Wilora palaeo-channel consists of Quaternary to Tertiary silicified calcrete that is part of the Ti-Tree Basin sedimentary succession. The Ti-Tree Basin sediments cover Cambrian and Neoproterozoic sedimentary rocks, which comprise sandstone, siltstone, shale, conglomerate and carbonate units. These units crop out along NNE- and W- trending ridges and low hills. The basement is composed primarily of granitoids, with several granite exposures to the southwest and southeast of the Wilora palaeo-channel (Figure 2).



Figure 2. Simplified geological map showing EL25367 and adjacent tenements held by Uramet Minerals Ltd as at 2007.

## 3.2 Tenement Geology

The geology of the Mt Skinner area is dominated by Neoproterozoic and Cambrian sedimentary rocks of the Central Mount Stuart and Octy Formations.

Cambrian and Neoproterozoic strike directions mainly trend NW-SE, sub-parallel to regional faults and shears such as the northwest trending Stirling Fault Zone. A secondary set of faults cross-cut the stratigraphy with a northeast strike.

A large proportion of the tenement is occupied by the 50 km long Wilora palaeo-channel, the main channel of which is ~3km wide. Multiple generations of calcrete and dolocrete have accumulated since the Tertiary. The main Wilora palaeo-channel drains towards the northwest and has a catchment area that extends to the Mt Skinner and Strangways Ranges to the southeast.

The Neoproterozoic Central Mount Stuart Formation covers most of the north-eastern and eastern part of the tenement. The Cambrian Octy Formation is unconformable on the Neoproterozoic sandstones. The succession is part of a tilted fault block dipping gently towards a geophysically-defined fault trending NW-SE. The Neoproterozoic sedimentary rocks range in thickness from a veneer at the base of the Cambrian (Dunster et al., 2007) in the north, to an interpreted 1200 m depth to the south.

Granitoid basement crops out in the south-eastern corner of the tenement and to the east just outside the tenement area (Figure 2).

# 4. Previous Exploration Work

Relatively little exploration work has previously been carried out within the Wilora palaeo-channel. Uranium exploration south of the tenement was undertaken by CRA in the 1970's (CR19740032) but only low uranium levels were reported.

Many explorers have previously investigated the area for base metals. Exploration within the tenement was initiated by Kennecott Exploration in 1966. The main targets were the malachite-bearing grey-green siltstone units that crop out throughout the area.

The NT Department of Mines and Water Resources drilled 4 holes for a total of 662 m in 1968 to investigate copper mineralisation at Mt Skinner (GR19680016). Alcoa of Australia Ltd continued exploration for copper and drilled 4 holes at Mt Skinner in 1981 (CR19820183).

In 1970, Centamin N.L. followed up on the holes drilled by Department of Mines and Water Resources and selected intervals of core which were assayed for Cu, Pb and Zn but without any significant results (CR19830125).

In 1983, Alcoa Australia Ltd flew an airborne magnetic survey at 500 m line spacing and drilled 4 holes close to previous holes. Operations ceased after re-evaluation of the data led to a down-grading in prospectivity of the area for base metals (CR19830125).

In 1995, CRA Exploration Ltd re-logged and assayed the Mt Skinner core drilled in 1968 but did not make any concluding remarks (CR19950562).

No significant drilling has been carried out since 1995. The NTGS re-evaluated the area as part of the Southern Georgina Basin Geology and Resource Potential Report in 2007 and concluded that Mt Skinner remains prospective for base metals (Dunster et al., 2007).

## 5. Exploration by Uramet

Exploration work by Uramet included a review of available data, reconnaissance and surface sampling, VTEM and gravity surveys, and aircore drilling (Figure 3).



Figure 3. Summary of exploration work by Uramet within EL25367

#### 5. 1 Desktop Review

#### 5.1.1. Wilora Palaeo-channel Uranium Project

A review of available literature including open file reports indicates that no significant mineral occurrence has been previously recorded within the Ti-Tree Basin units located within the tenement area.

Airborne radiometric surveys completed by the NTGS (Barrow Creek – 1981 and Alcoota –1997) highlighted the radiogenic nature of the granitoid suite and arkoses in the upper reaches of the palaeo-drainage system, which contain significant uranium levels, generally between 9 to 100 ppm U, based on open file rock chip data. Anomalous levels of uranium were reported from bore water

samples (up to 226 ppb U from 8 Mile Bore located west of the tenement area, CR19740032) and from sediments in streams draining the uranium source rocks.

Airborne radiometric data show uranium anomalies over a section of the Hanson River, over the Stirling swamp (both west of the tenement) and parts of the palaeo-channel within the tenement (Figure 4).

Units within the Ti-Tree Basin associated with the Wilora palaeo-channel are considered as favourable for hosting uranium deposits. Calcrete-hosted and sandstone-hosted uranium deposit styles are possible within the palaeo-channel succession.



Figure 4. Radiometric map (equivalent uranium, eU) of the Wilora palaeo-channel area showing calcrete-filled palaeochannel and modern drainage channels. Geophysical data processed by R. Clifton, NTGS.

## 5.1.2. Mt Skinner Base Metals Project

A review of open file exploration reports and drill core data indicates that Mt Skinner is prospective for stratiform copper mineralisation (Figure 5) in the Neoproterozoic Central Mount Stuart Formation and epigenetic base metal mineralisation in the Elyuah Formation. Copper mineralisation occurs on the surface and extends for several kilometres along strike and consists of malachite-stained rocks and float (Dunster et al., 2007; Figure 4). Visible galena, pyrite, chalcopyrite and fluorite were described by Dunster et al. (2007) in core CMS4 at a depth of 247m to 260m. Whole rock geochemistry carried out during the same study confirmed elevated lead, zinc and barium levels and revealed previously unrecognised lead-zinc mineralisation at depth.



Figure 5. Mt Skinner geological map showing cupriferous outcrop, Dunster et al., 2007

#### 5. 2 Reconnaissance Work

Reconnaissance work was carried out in several campaigns, with a total of 25 rock chip samples being analysed using a portable Niton XRF. Many of the samples were of outcropping malachitebearing siltstone and associated float, and due to the high copper content of these samples, erroneous copper results were given by the Niton when in "soil mode". However up to 600 ppm uranium was obtained in one malachite bearing sample. Results are appended in digital form.

#### 5. 3 Core Examination

Selected core intervals of three historical drill holes from the Mt Skinner area (Mt Skinner 1, 2, 3) and one drill hole from the Wilora Palaeochannel (railway technical hole RA194/920RH1) were inspected at the NTGS Alice Springs Core Library and analysed with a portable Niton XRF. The

results for the Mt Skinner holes confirm previously reported geochemical data. Maximum spot assays of 2.3% Cu and 402 ppm Zn were recorded from Mt Skinner 1. The results indicate an absence of lead-zinc mineralisation in the Central Mount Stuart Formation. None of these holes intersected the prospective Elyuah Sandstone Formation. Spot analyses up to 64 ppm uranium were returned from calcrete in the railway technical hole.

## 5. 4 Aircore Drilling

Aircore drilling was carried out throughout September and October 2007 drilling a total of 4359m in 243 holes; of which 113 holes for 1872m are located within the tenement. The aim was to target calcrete-hosted uranium in the upper 15m of the palaeo-channel. In addition, several reconnaissance holes were drilled in the Mt Skinner base metal area. Drill locations within the palaeo-channel were along tracks or fence lines and also along cleared lines perpendicular to the palaeo-flow direction with spacing of 400m between the lines and 200 m or 100m spacing between drill locations along a line. Rig access proved difficult in the central part of the channel due to extensive aeolian sand cover over calcrete.

Within the Wilora palaeo-channel, anomalous uranium is mainly concentrated in the lower part of the calcrete/dolocrete/silcrete succession. The succession occurs as a series of elongated 'ribbons' trending NW, which can be up to 19m thickness in the centre but thinning towards the edges. Vertically, these ribbons consist of weathered calcrete on the surface, soft and occasionally clay-rich calcrete, mixed calcrete and dolocrete, dolocrete and silicified dolocrete. The groundwater table sits mainly just below the silicified dolocrete. The aquifer contains mottled calcrete and brownish sands. Groundwater quality tends to be good but becomes saline to the NW.

Reconnaissance drilling in the Mt Skinner project area comprised of four drill holes with a maximum depth of 59m penetrating Neoproterozoic sedimentary rocks. Two holes were strategically placed on either side of an interpreted fault and intersected fault gouge at 27m depth. Drilling proved difficult and the two holes failed to reach any significant depth.

## 5. 5 Drillhole Geochemistry

Laboratory geochemical analyses were undertaken on 214 samples collected from 13 drill sites of which two are within the tenement. Samples were analysed at UltraTrace Laboratory in Perth, W.A., for Al<sub>2</sub>O<sub>3</sub>, CaO, Cu, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, MgO, Pb, SiO<sub>2</sub>, SO<sub>3</sub>, SrO, V<sub>2</sub>O<sub>5</sub>, Zn, ZrO<sub>2</sub>, U and Th. The elements were determined by X-Ray Fluorescence Spectrometry. Au was determined by Aqua Regia digest and Inductively Coupled Plasma (ICP) Mass Spectrometry.

The results show that uranium levels are not of economic significance in any of the samples.

Most of the samples that contain calcrete, dolocrete and/or silcrete were analysed on site with a portable Niton XRF analyser. Average uranium contents were 46 ppm in a total of 550 samples, another 1037 measurements showed no detectable uranium (the detection limit is approximately 20 ppm). Niton measurements on 645 samples were taken within the tenement; the highest value recorded was a spot analysis of 102 ppm (Figure 6).



Figure 6. Uranium distribution in drill holes in the Wilora palaeo-channel (Niton XRF). Tenement outline in red. Yellow = calcrete, Black dashed line = inferred palaeochannel outline, Blue = sedimentary rock, Red = granite.

All 120 samples from four reconnaissance holes in the Mt Skinner base metal area were analysed on site with the Niton XRF. The results confirm anomalous copper at the surface and elevated lead values up to 128 ppm were recorded at the end of hole WAC0175 at 18 m depth.

#### 5. 6 Helicopter-borne Electromagnetic Survey

A helicopter-borne EM (VTEM = versatile time domain electromagnetic) survey amounting to 361 line-kilometres over the tenement was flown by Geotech Airborne Ltd (www.geotechairborne.com.au) in October 2007. The survey covered the eastern area of the tenement (Fig.7) and adjacent areas on neighbouring tenements. Analysis of the data failed to identify any massive sulphide targets.



Figure 7. Preliminary VTEM results - channel 17 overlain on the Woodgreen 1:100K geological map.

## 5. 7 Gravity Surveys

During 2008 two ground gravity surveys were conducted in the south eastern part of the tenement (Figure 3), the northern one being part of a large survey mainly located on an adjacent tenement. The gravity surveys were infilling gravity a regional survey conducted by Geoscience Australia (GA) and the Northern Territory Geological Service (NTGS) to 500m spacings.

The contractor used was Atlas Geophysics of Perth, utilising a Scintrex CG5, facilitated by a Robinson R44 Raven II helicopter.

No significant gravity anomalies were defined. Gravity data is appended in digital form.

## 6. Conclusions

The Wilora aircore drilling program revealed an extensive uranium anomaly within the palaeochannel, however the uranium levels recorded are currently below economic values. No massive sulphide type anomalies were defined by the VTEM.

## 7. References

Dunster JN, Kruse PD, Duffett ML and Ambrose GJ. 2007. Geology and resource potential of the southern Georgina Basin, Northern Territory, NTGS