



## **Annual Technical Report EL26900-Manbulloo-Daly Basin**

**For the period 14<sup>th</sup> May 2011 to 13<sup>th</sup> May 2012**

**May 2012**

### PROJECT DETAILS

DATE	24 <sup>th</sup> May 2012
PROJECT NAME	Katherine
REPORT TITLE	<b>Annual Technical Report EL26900-Manbulloo-Daly Basin</b> <b>For the period 14/5 /2011 to 13/5/ 2012</b>
TENEMENT HOLDERS	Century Hill Pty Ltd    Operator: Consolidated Global Investment Ltd
TENEMENT NO.	EL 26900
KEYWORDS	Daly Basin, Middle Cambrian, phosphate
TYPES OF WORK	Review of regional radiometric, magnetic, landsat and mineral data. Geological review of EL26900. Field reconnaissance conducted with 15 Niton field XRF readings taken of rock outcrops and with 3 rock samples submitted for multi-element laboratory analysis. Lithological descriptions were made of rock samples.
COMMODITY (TARGET)	Phosphate
TECTONIC UNIT	Daly Basin
GEOLOGICAL AGE	Proterozoic, Palaeozoic, Tertiary
NEARBY TOWNS	Katherine
GEOLOGICAL MAPS	1: 250 000-Katherine SD53-09 1: 100 000-Manbulloo 5368
AUTHOR	Brett Townsend

## **ABSTRACT**

EL26900-Manbulloo located within the Daly Basin, southeast of Katherine was acquired for its potential to host rock phosphate. During the reporting period the following work was carried out:

- Review of regional radiometric, magnetic, landsat and mineral data
- Geological review of EL26900
- Field reconnaissance conducted
- 15 in field Niton XRF readings taken from rock outcrops
- 3 rock samples submitted to laboratory for multi-element analysis
- Lithological description of 3 rock samples

Lithologies of rock samples collected in the field were described generally as limestone, with all samples KS2 to KS4 interpreted as Jinduckin Formation.

Rock chip assays for tenement EL26900 were unremarkable, with none of the returned assays elevated in any elements to significant levels.

Niton field assays returned a marginally anomalous Sn value of 851ppm for sample Ks3c and a Zn value of 123ppm for sample Ks3d, a K value of 2.84% for sample Ks3j and sample Ks3g returned a Nb value of 1703ppm.

Access into the tenement was limited due to wet ground conditions and sample locations were restricted to the southwest of the tenement.

Contingent upon overall project assessment of the phosphate potential of the tenement to be carried out over the coming weeks, activities for the next 12 months might include a comprehensive rock chip sampling and assaying over areas not yet sampled (due to wet access conditions).

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## 1.0 INTRODUCTION

Consolidate Global Investments (CGI) has 5 tenements in the Northern Territory prospective for rock phosphate mineralisation, one of these tenements, EL26900, the subject of this report, is located within the northern edge of the Daly Basin as shown in Figures 1-3.

The tenement is held in the name of Century Hill Pty Ltd which is a wholly owned subsidiary of Consolidated Global Investments Limited (CGI), A.C.N 009 212 293.

CGI recognises the importance of phosphate mineralisation. Phosphate rock is the basis for a major world industry for the manufacture of phosphate fertilisers and phosphorous-based chemicals. Phosphorite deposits are widespread in the Proterozoic and Cambrian sediments of Australia although with the exception of the Georgina Basin they are small and uneconomic. Within the Georgina basin the Duchess Deposit in Northern Queensland was in production between 1975-1978 and 1981-1982. The total resource at Duchess is 1000mt @ 17-18% P<sub>2</sub>O<sub>5</sub>, (DSO is >= 30% P<sub>2</sub>O<sub>5</sub>).

Phosphate Rock occurs as an agglomeration of apatite either as fluoroapatite FP<sub>2</sub>O<sub>5</sub>, apatitic apatite, microcrystalline apatite and crystalline apatite.

## Tenure

Tenement details are given in Table 1.

**Table 1-Tenement Schedule**

Tenure ID	Ownership	Name	Approval Date	Expiry Date	Size (Blocks)	Area Km <sup>2</sup>	Mineral Field	Rent \$	Expenditure \$
EL26900	Century Hill Pty Ltd	Manbulloo	14/5/2009	13/5/2015	40	125.9	Northern	858	17,500

## 1.1 PROJECT LOCATION, RELIEF & CLIMATE

ELA 26900 is located some 240km south of Darwin and 7km north of the town of Katherine, see Figure 1.

The Project area located southeast of Katherine, the fourth largest town in the Northern Territory.

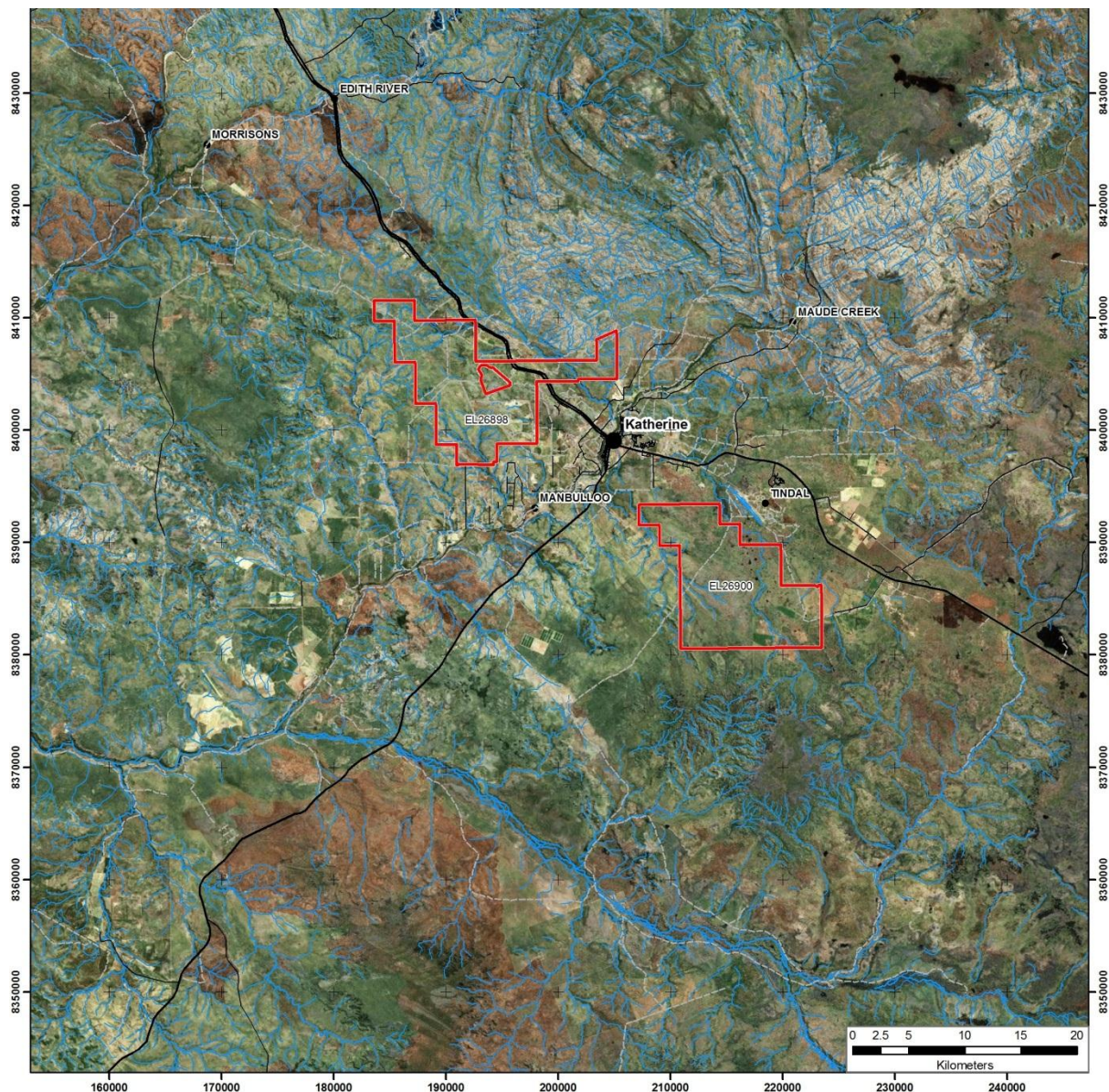


The project area has a sub-tropical climate, with distinct wet and dry seasons. Average annual rainfall of 1040mm is mainly received in January to early March, with an average of 74 rain days per year.

Average temperatures range from 25° to 35° Celsius, with an occasional 40° during November and December, usually accompanied by very high humidity.

The Dry Season has beautiful weather with temperatures regularly dropping down to 10° Celsius overnight.

There is no shortage of water and sunshine to support the fast growing agricultural and horticultural industries in the region.



**FIGURE 1-TENURE LOCATION**

## 1.2 SETTING

The majority of phosphate deposits worldwide (130+) are of Neoproterozoic-Cambrian in age with the most abundant being in the early-to-middle Cambrian with later deposit peaks during the Middle Permian, Late Cretaceous-Palaeocene and the Mesozoic. These phosphogenic occurrences occur as a result of an up-welling of phosphate-rich deep ocean waters. Phosphate Rock occurs as an agglomeration of apatite either as fluoroapatite  $\text{FP}_2\text{O}_5$ , aphanic apatite, microcrystalline apatite and crystalline apatite.

Phosphate rock is the basis for a major world industry for the manufacture of phosphate fertilisers and phosphorous-based chemicals. Within Australia phosphorite deposits are widespread in the Proterozoic and Cambrian sediments, with middle Cambrian rocks of central and northern Australia hosting several major phosphate deposits in Queensland Georgina Basin which include:

- Duchess-Phosphate Hill
- Lady Annie
- D Tree

Whilst within the Northern Territory the Georgina Basin is host to the following Phosphorite deposits:

- Wonarah
- Alexandria
- Alroy
- Highlands Plains

Middle Cambrian shallow marine sediments close to basin edges or basinal highs are likely targets for phosphorite mineralisation. Both the Georgina and Daly Basins shallow marine sediments were laid down in the Middle Cambrian.

Exploration has discovered a number of phosphate deposits within the Georgina Basin however little to no phosphate exploration has been carried out within the Daly Basin.

With the completion of the Darwin to Alice Springs Railway line bulk commodity mineralisation within reasonable trucking distance of the railway line makes the possibility of a phosphate development more feasible from the Northern Territory.

Whilst the Georgina Basin hosts the largest number of phosphate deposits the Daly Basin is of a similar age and prospectivity with virtually no phosphate exploration conducted to date within it.



The Wonarah Phosphate deposit is owned by Minemakers Limited and contains a JORC Inferred resource of 1105mt @18% P<sub>2</sub>O<sub>5</sub>. The project lies 80km east of the Arruwurra Phosphate deposit (131mt @ 18.6% P<sub>2</sub>O<sub>5</sub>-Minemakers Limited). The location of the Minemakers Project is given in below. Minemakers has commenced trial mining and has shipped a trial parcel of ore out of the Darwin port in early 2010.



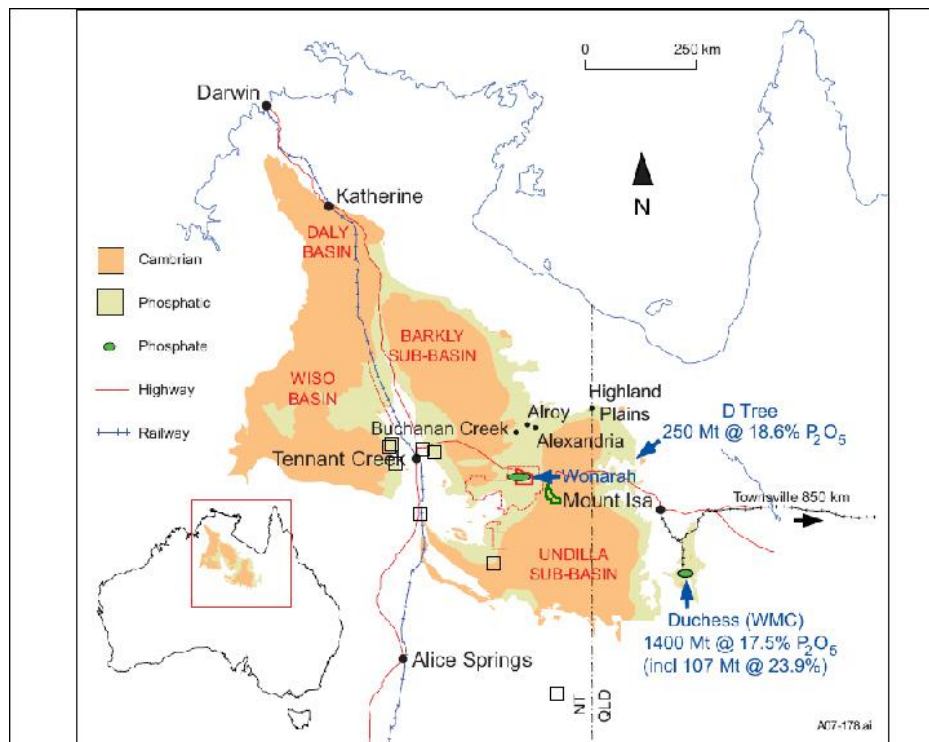
**FIGURE 2-PROJECT LOCATION**



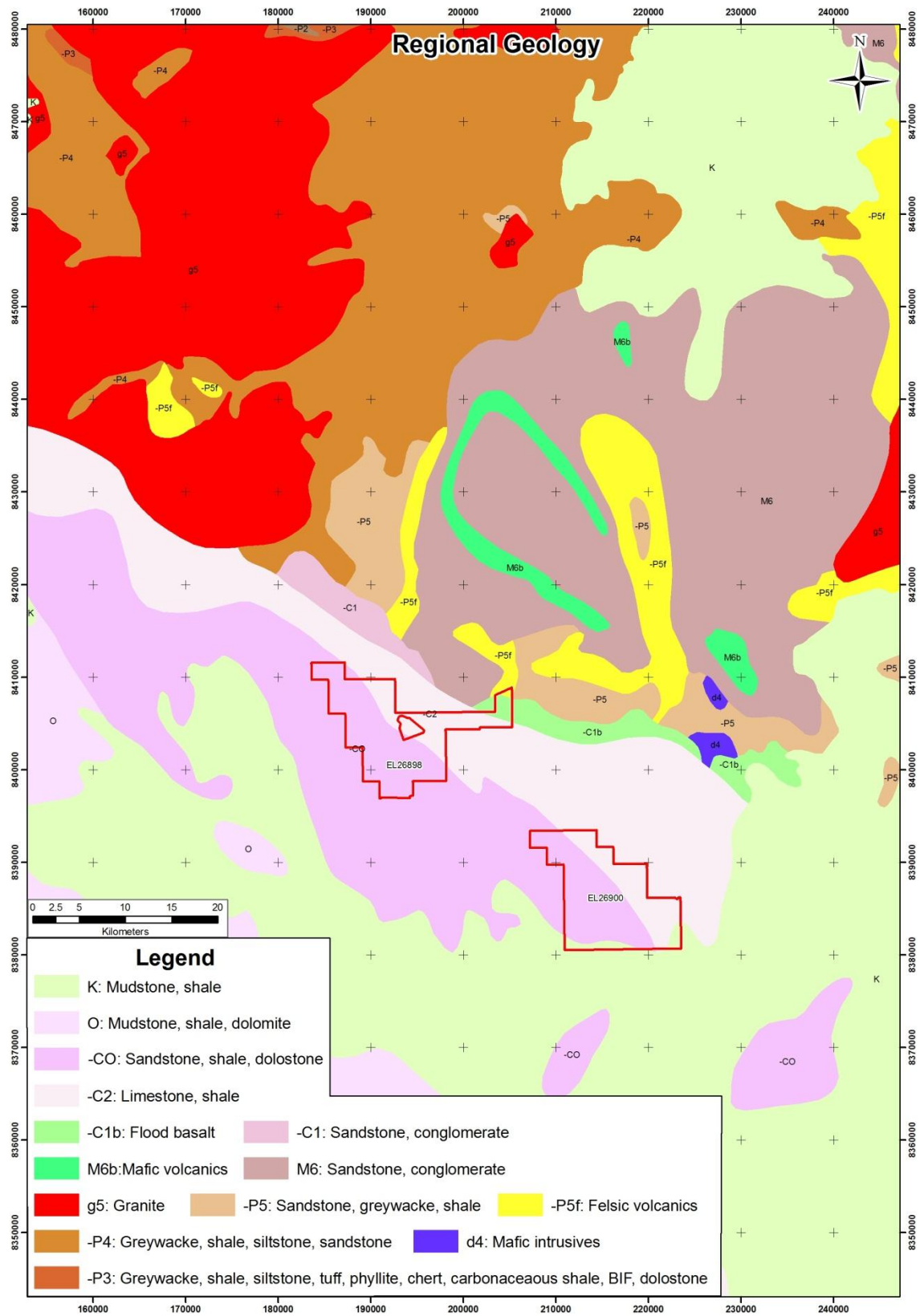
## 2.0 REGIONAL GEOLOGY

The tenure lies within the Daly Basin which was deposited unconformably on a basement of Antrim Plateau Volcanics between 470-520Ma ago in the Ordovician-Cambrian. The Daly Basin is an intra-cratonic basin composed of flat lying sedimentary rocks of the Daly River Group which are comprised of shallow marine sediments which are prospective for phosphate and detailed as:

- *Tindall Limestone*- Bioclastic mottled oncoid and stromatolitic limestone, minor mudstone and basal conglomerate, arkosic sandstone and siltstone.
- *Jinduckin Formation*- Dolomitic siltstone dolstone and dolomitic quartz sandstone.
- *Oolloo Dolstone*-Ooids and stromatolitic dolstone and minor dolomitic sandstone



**Figure 3- Simplified geology of the Georgina, Wiso and Daly basins showing the distribution of phosphorite facies depocentres and major phosphate deposits. Source: Khan et al.**



**FIGURE 4 – Regional geology**

## 2.1 PROJECT GEOLOGY

The Daly Basin is an intra-cratonic basin composed of flat lying sedimentary rocks of the Daly River Group which are comprised of:

- *Tindall Limestone*- Bioclastic mottled oncoid and stromatolitic limestone, minor mudstone and basal conglomerate, arkosic sandstone and siltstone.
- *Jinduckin Formation*- Dolomitic siltstone dolstone and dolomitic quartz sandstone.
- *Oolloo Dolstone*-Ooids and stromatolitic dolstone and minor dolomitic sandstone

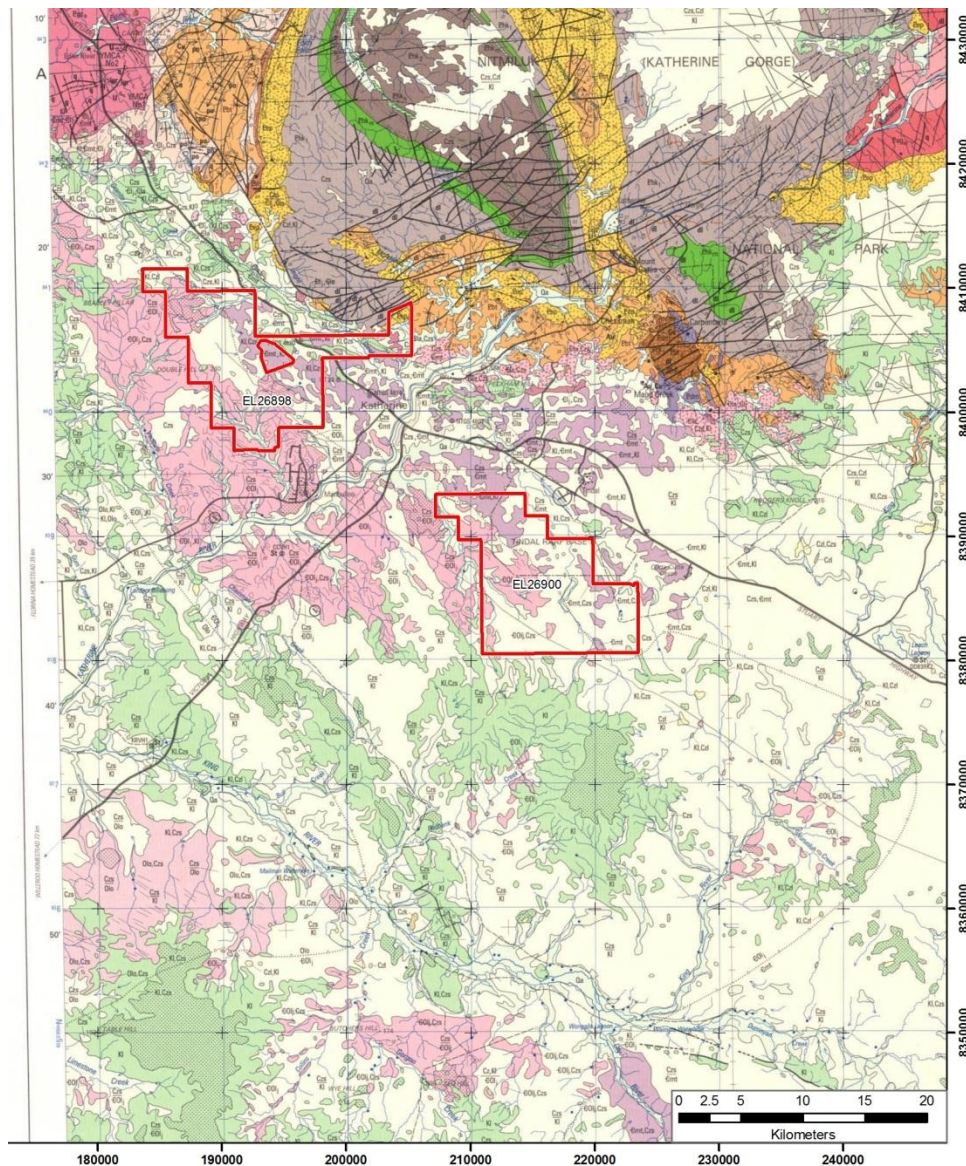


Figure 5 – Project Geology Showing Areas of Jinduckin & Tindall Limestone

(Middle Cambrian shallow marine sediments)



### 3.0 MINERAL PROSPECTIVITY

It is well documented that some 130+ deposits of phosphate are of Neoproterozoic-Cambrian in age with the most abundant being in the early to middle Cambrian with later deposit peaks during the Middle Permian, Late Cretaceous-Palaeocene and the Mesozoic. These phosphogenic occurrences occur as a result of an upwelling of phosphate-rich deep ocean waters. Northern Territory Geological Survey carried out analysis of drill cuttings from a selection of water bores drilled within 100km of the Darwin-Alice Springs railway line for phosphate. None of the cuttings selected from the Daly Basin returned  $P_2O_5$  analysis >2% (considered anomalous). However the shallow marine sediments of the Tindall Limestone and the Jinduckin Formation exist within the Daly Basin Project Tenure and as such remain a target.

#### 3.1 OPEN FILE RESEARCH-DALY BASIN

The majority of the exploration carried out in the Daly Basin in and around EL26898 has been for diamonds, gold, base metals, uranium and limestone (for cement manufacture). Very little exploration has been carried out directly for phosphate mineralisation.

In and around the current tenure EL26898 and EL26900 north-west and south-east respectively of the town of Katherine exploration has been confined to limestone exploration for cement manufacture. No phosphate analysis has been carried out

Detailed below are summaries of the only specific phosphate exploration carried out within the Daly Basin on record within Open File.

##### **1967-1968- Continental Oil Co of Australia-Katherine & Litchfield Area**

A Large area between Litchfield and Katherine was explored for phosphate mineralisation. The company mapped and rock chipped out crops of shallow marine sediments to test for phosphate. No anomalous intersections were found however (typically less than 2%  $P_2O_5$ ) the study determined that the Tindall Limestone (Middle Cambrian) and the Oolloo Limestone (Lower Silurian) is more phosphatic than the Jinduckin Formation (Cambrian-Lower Ordovician). The Tindall Limestone maximum  $P_2O_5$  content was 2%. The company felt that the limestones investigated were unlikely to host commercial quantities of phosphate.

##### **1971-CRA Exploration Pty Ltd – south west of EL26898**

CRA carried out airborne radiometrics, stream sediments exploring for base metals and uranium. Nothing significant was returned. Maximum  $P_2O_5$  levels were in the order of around 0.07%.



## 4.0 EXPLORATION CONDUCTED

During the reporting period the following work was carried out:

- Review of regional radiometric, magnetic, landsat and mineral data
- Geological review of EL26900
- Field reconnaissance conducted
- 15 in field Niton XRF readings taken from rock outcrops
- 3 rock samples submitted to laboratory for multi-element analysis
- Lithological description of 3 rock samples

Radiometric, magnetic and landsat data are depicted in Figures 6,7and 8 below.

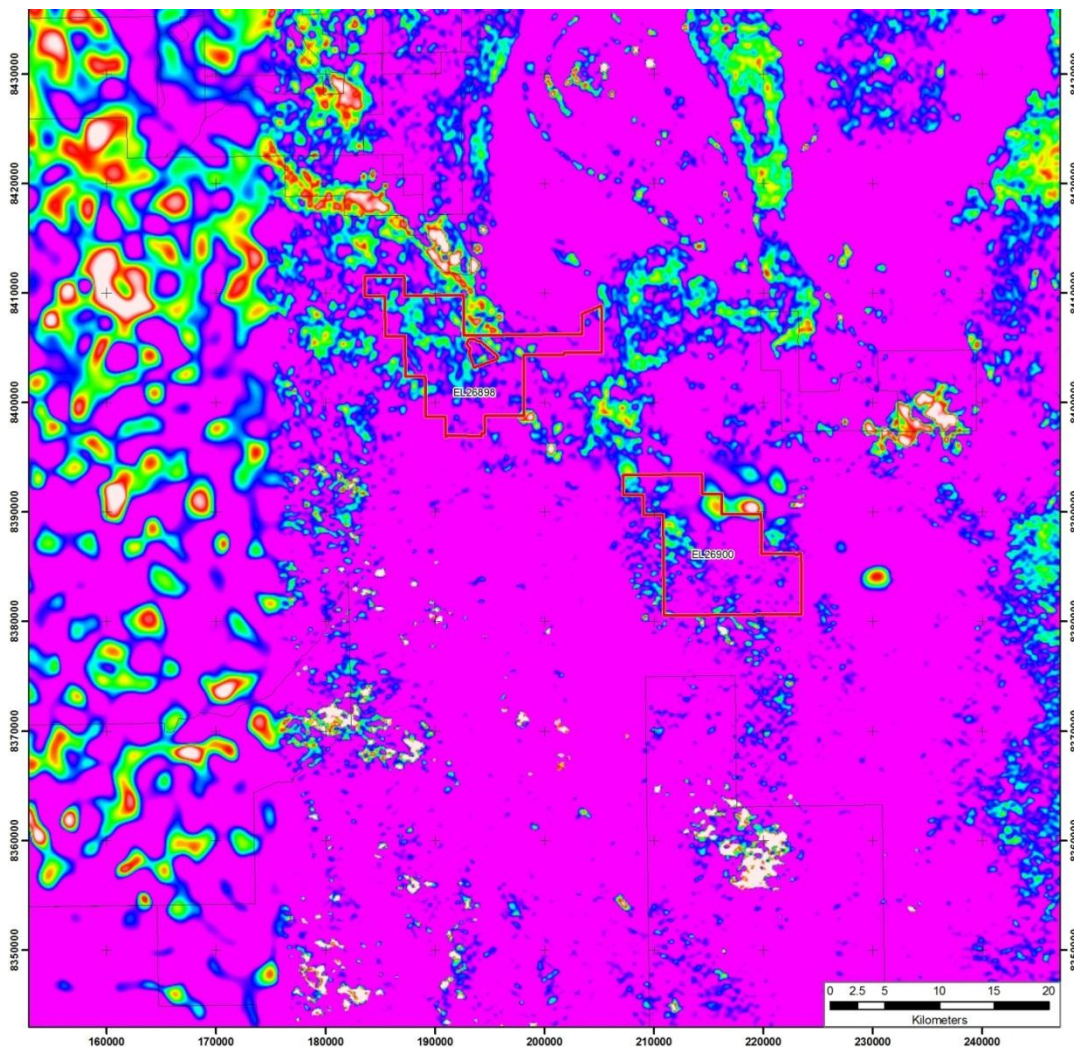
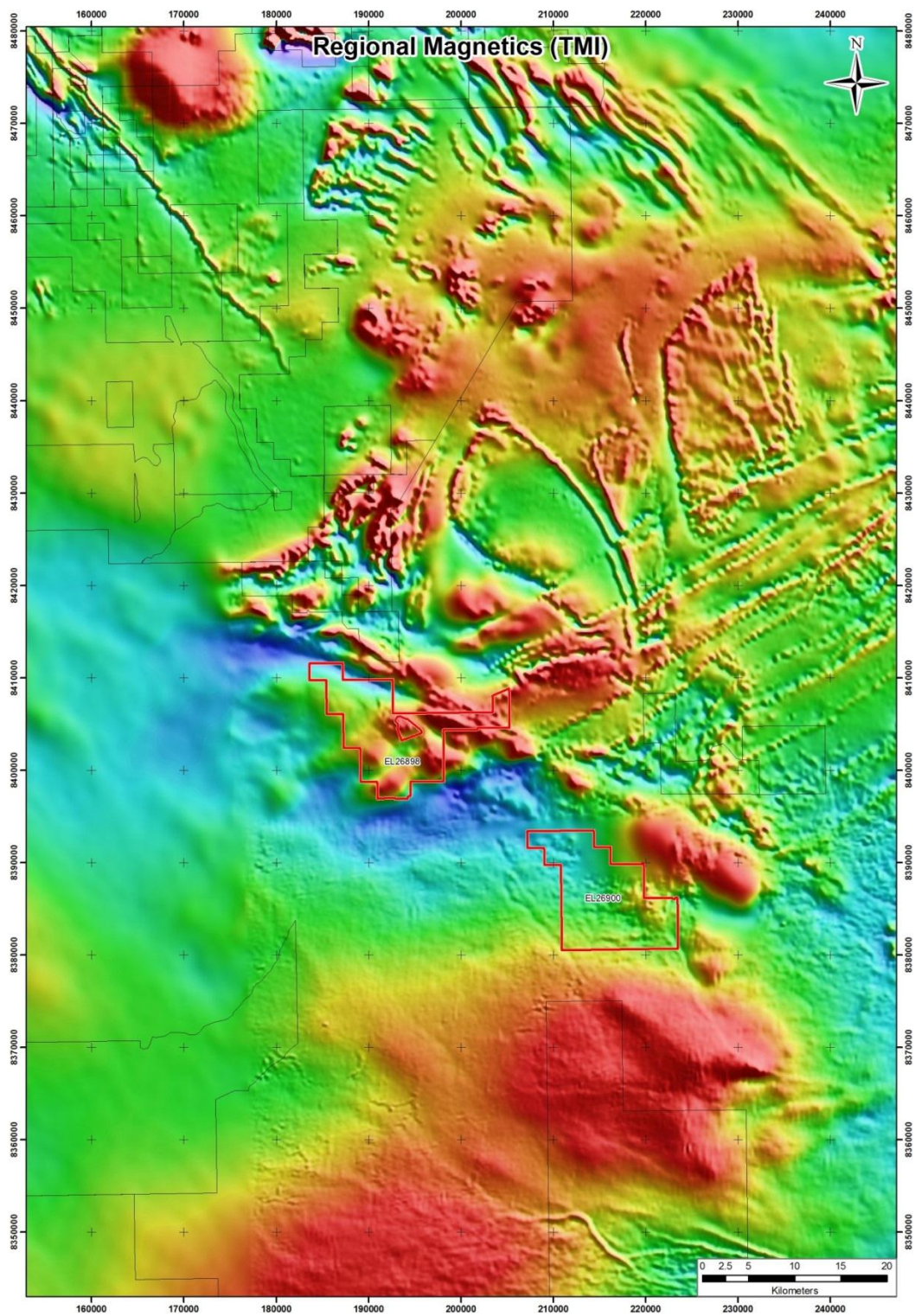


Figure 6 - Regional Radiometrics U2/Th



**Figure 7 – Regional Magnetics**



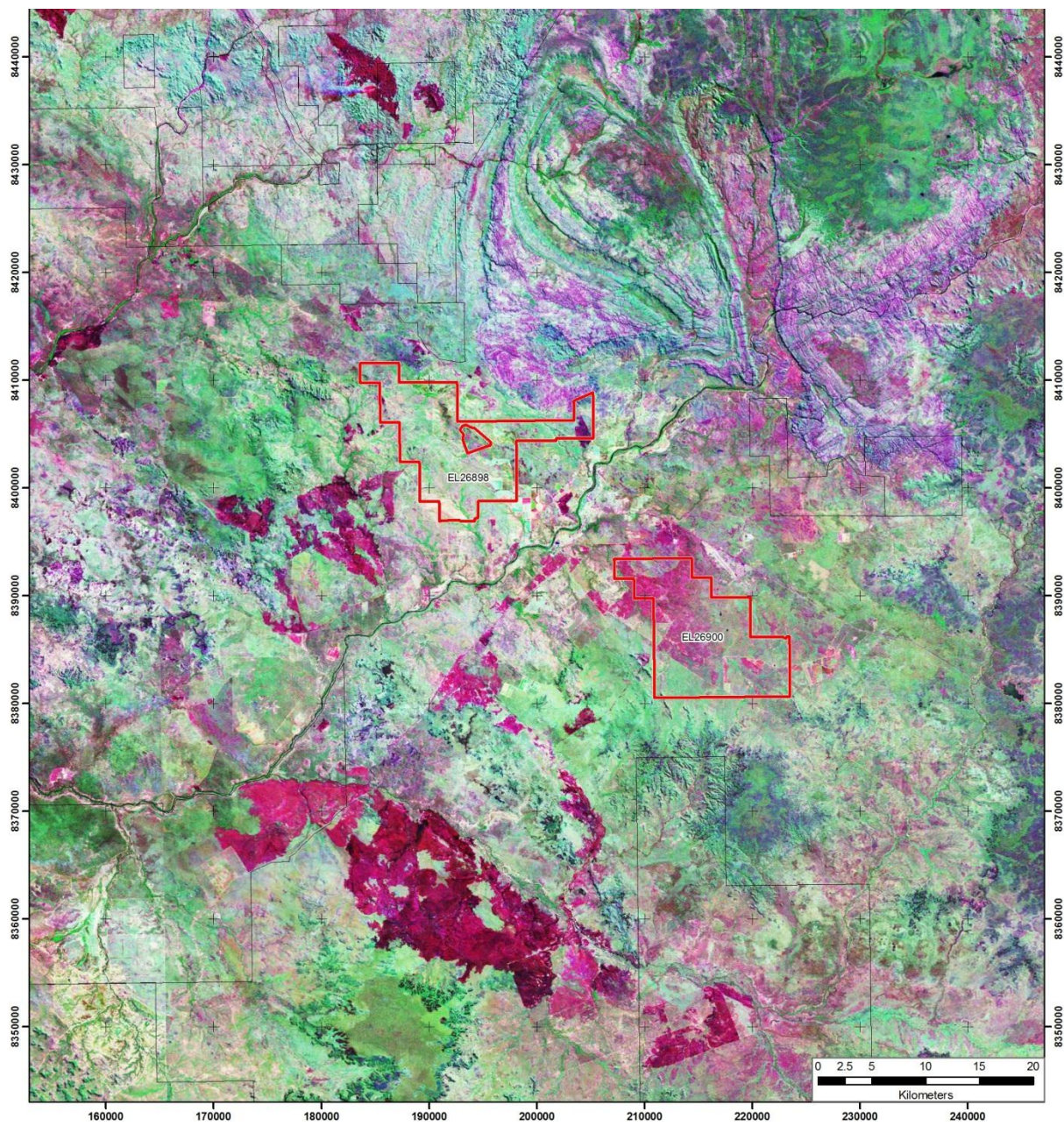


Figure 8 – Landsat 742



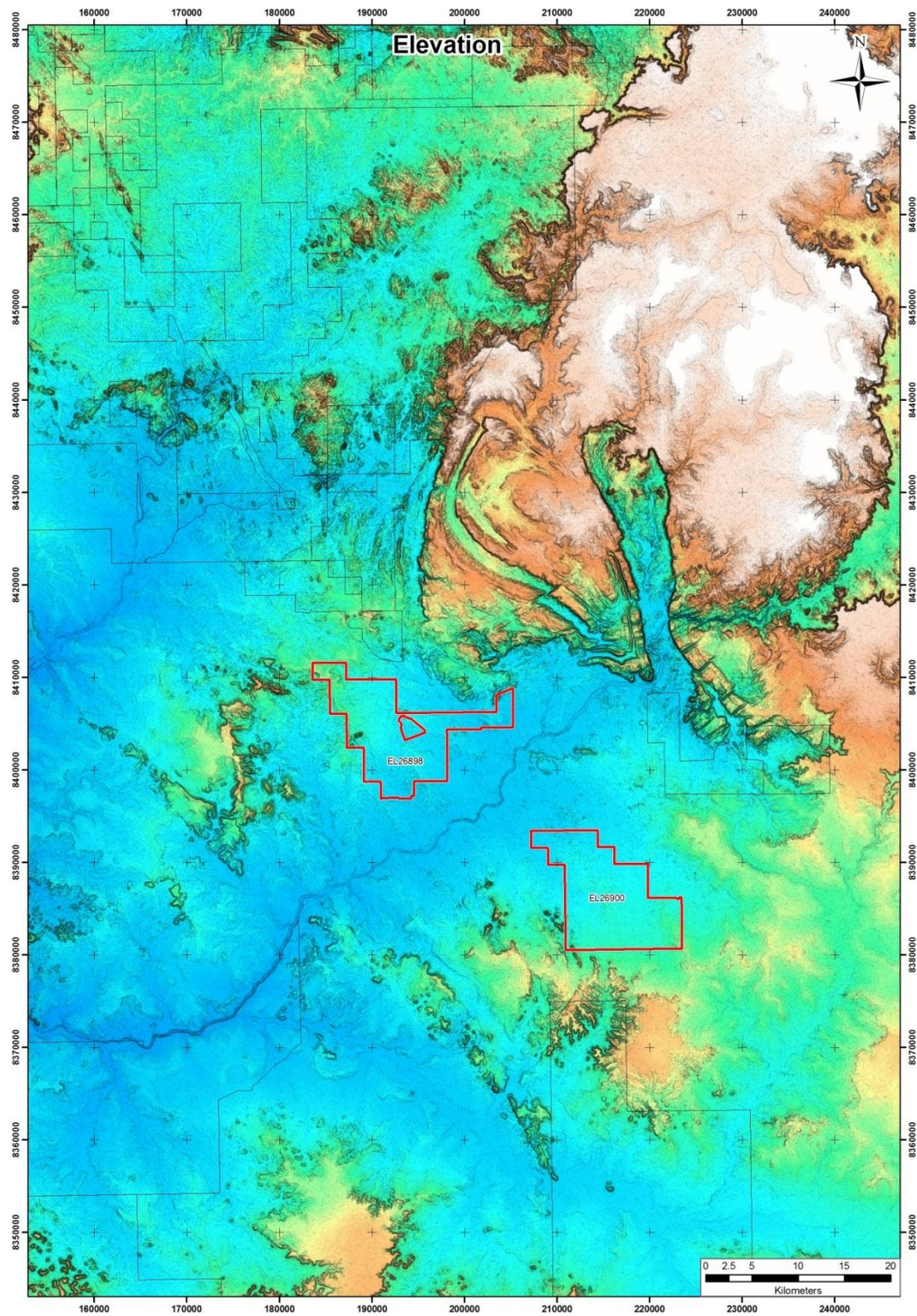


Figure 9 - Regional Elevation



### Reconnaissance Field Trip

A reconnaissance field trip was made to the Company's Daly Basin tenements in April 2012. The conditions were very wet in places and in parts the country was too rugged for 4WD access, restricting access to the southwest of the tenement. Four rock samples were collected from limestone outcrops – these are shown on Figure 10. Of these three samples were submitted for multi-element laboratory analysis and lithological description. Lithological descriptions and assay results are shown in Appendix 1 and Appendix 3. A series of Niton hand-held XRF readings were also taken in the field and these are tabulated in Appendix 2.

Rock chip assays for tenement EL26900 were unremarkable, with none of the returned assays elevated in any elements to significant levels.

Niton field assays returned a marginally anomalous Sn value of 851ppm for sample Ks3c and a Zn value of 123ppm for sample Ks3d, a K value of 2.84% for sample Ks3j and sample Ks3g returned a Nb value of 1703ppm.

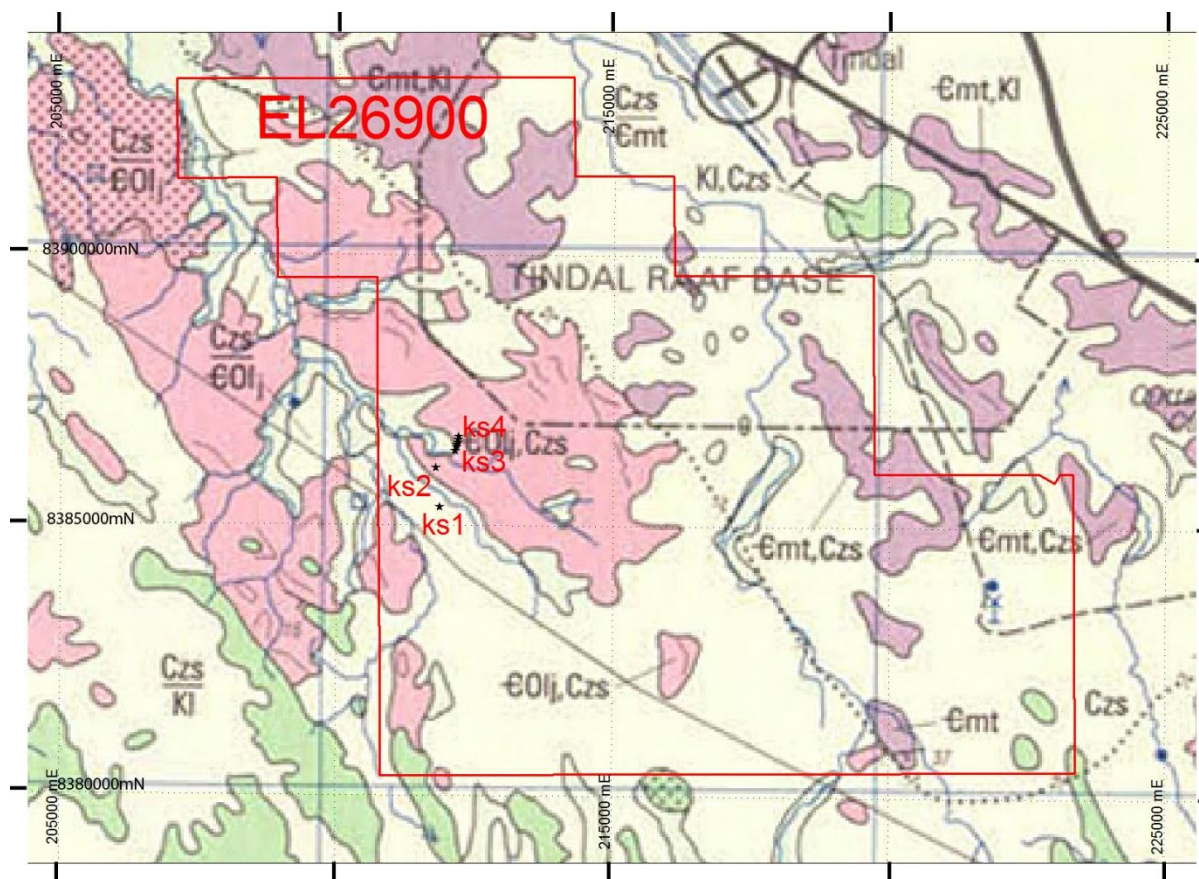


Figure 10 – Rock Sample Locations

## 5.0 FUTURE WORK

Contingent upon overall project assessment of the phosphate potential of the tenement to be carried out over the coming weeks, activities for the next 12 months might include a comprehensive rock chip sampling and assaying over areas not yet sampled (due to wet access conditions).

## 6.0 REFERENCES

- Geological Survey Record-NT-2007/003-M Khan, PA Ferenczi, M Ahmad, PD Kruse-Phosphate testing of water bores and diamond drill core in the Georgina, Wiso and Daly basins, Northern Territory
- Geological Survey Record-NT- 2008/1- PD Kruse- Georgian Basin Stratigraphic Drilling 2002-2006 and Petrography 200-2007.
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