# PINE CREEK PROJECT

## EL33188

## Dorat

## Partial Relinquishment Report for the Period

## 13 January 2024 to 12 January 2025

| | |
|---|---|
| Tenure Holder: | Mangusta Minerals Pty Ltd |
| Project Operator: | Mangusta Minerals Pty Ltd |
| Commodity: | Gold, Lithium |
| Author: | Bianca Manzi |
| Contact: | bm@desotoresources.com |
| Date: | 21/02/2025 |
| Map Sheets: | 1:250,000 Pine Creek (SD5208) |

Distribution: NTGS

Mangusta Minerals Pty Ltd

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## Digital Data Files

| File Name | Description | File types |
|---|---|---|
| EL33188_2025_A_01_Report.pdf | Annual Report | pdf |
| EL33188_2025_A_02_Appendix1_SurfaceGeochem.txt | Surface sample location and assays | txt |
| EL33188_2025_A_03_Appendix1_SurfaceGeochemQAQC.txt | Quality control data | txt |

## ABSTRACT

Mangusta Minerals Pty Ltd, a 100% subsidiary of DeSoto Resources Limited, holds and operates the Pine Creek Project licence Dorat (Shoobridge West) EL33188, located approximately 150 km south of Darwin, Northern Territory.

A major structure, the Fenton Shear Zone (FSZ), is interpreted from regional geophysics (gravity and magnetics) along the eastern edge of the Fenton anticlinorium. It is comparable in scale to the Pine Creek Shear Zone through the central part of the Pine Creek Orogen which hosts significant gold resources.

The Shoobridge West licence occurs to the north of the FSZ and is covered by Cambrian limestones and mudstones of the Daly Basin which are interpreted to overlie structurally complex Palaeoproterozoic gold and lithium prospective rocks.

A total of 12 sub-blocks were relinquished from the licence in Year 2 on 12 December 2024, with 13 sub-blocks retained as EL33188.

Exploration activities have included an assessment of the geology and regolith domains to determine the appropriateness of stream sediment sampling for lithium exploration, historical data compilation, and a surface geochemical sampling program comprising streams (12) and rocks (5). No significant lithium mineralisation was encountered.

An assessment of existing geological and geophysical datasets suggests that the relinquished blocks have significant thicknesses of Cambrian Limestone, Cretaceous and younger cover rocks overlying the Proterozoic basement and have low potential to host economic gold, base metal or lithium mineralisation. No further work is recommended on these blocks, and they have been relinquished.

# 1 INTRODUCTION

This partial relinquishment report details the work undertaken by Mangusta Minerals Pty Ltd (Mangusta) on the Dorat (Shoobridge West) licence EL33188 during the period from 13th January 2023 to 12th January 2025.

## 1.1 Location and Access

EL33188 is part of Mangusta's Pine Creek Project and covers an area of 83.5 km$^2$, located approximately 150km south of Darwin in the Northern Territory (Figure 1). The licence area is predominantly freehold land (Lots 4723, 6885 & 6886) with small areas partly located within the Tipperary East (7348) and Douglas (7122) pastoral stations in the south. Access to the northern part of the property is from the sealed Stuart Highway via private roads and tracks, while access to the west and south area is via Dorat Road and various tracks.

The project falls within the Pine Creek (SD5208) 1:250,000 scale topographic and geology map sheets, and the Batchelor 1:100,000 scale geology sheet (SD5171).

The project is in the tropical savannah region of the Northern Territory characterised by distinct six-month dry seasons from April to October followed by humid wet seasons from November to March.

Pine Creek lies predominantly within the Daly Basin Bioregion and the western edge of the Pine Creek Bioregion. The vegetation of the bioregion is characterised by woodland and open forests. It includes gently undulating plains with scattered low plateau remnants and some rocky hills and gorges. The Project is situated within the Daly River catchment area and is covered by several ephemeral drains and creeks which discharge to the northwest into the Daly River system.

## 1.2 Tenure and Licence Details

EL33188 was granted to Mangusta Minerals Pty Ltd for a period of six years on 13th January 2023 (Table 1). The initial application area of 84km$^2$ was reduced to the currently granted area of 83.5km$^2$ in response to objections received from a number of small freeholders during the grant process.

Mangusta is a wholly owned subsidiary of Desoto Resources Ltd (ASX:DES) which was listed on 14th December 2022.

At the end of Year 2, a partial surrender of 12 sub-blocks was made (Figure 2). The retained are of EL33188 is now comprised of 13 sub-blocks for

*Table 1: Authority Details for EL33188*

| Tenement | Holder | Grant Date | Expiry Date | Area (units) |
|---|---|---|---|---|
| EL33188 | Mangusta Minerals Pty Ltd | 13 January 2023 | 12 January 2029 | 25 |
| **After partial relinquishment** | | | | |
| EL33188 | Mangusta Minerals Pty Ltd | 13 January 2023 | 12 January 2029 | 13 |

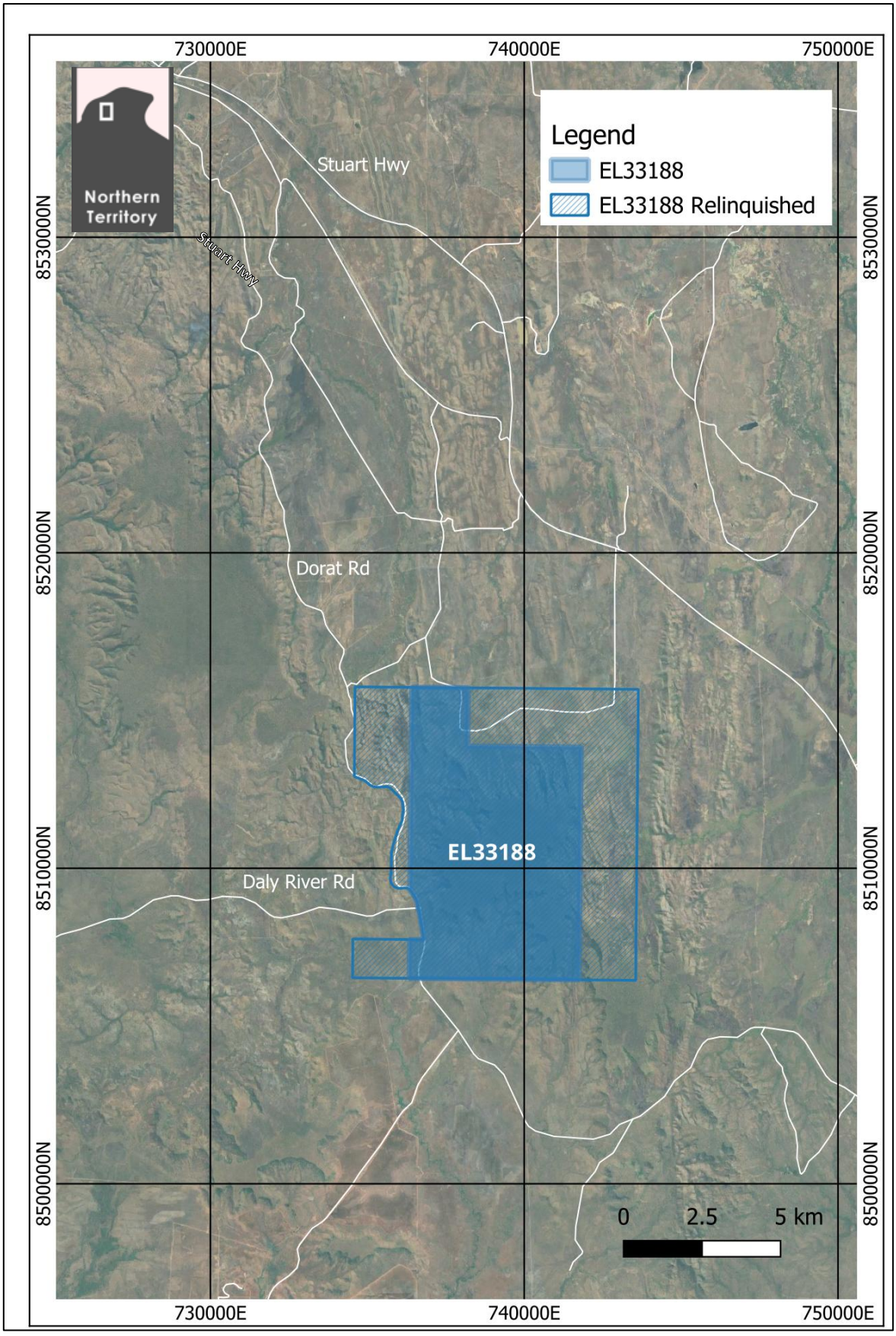


*Figure 1: Location Map of the EL33188 Dorat (Shoobridge West)*

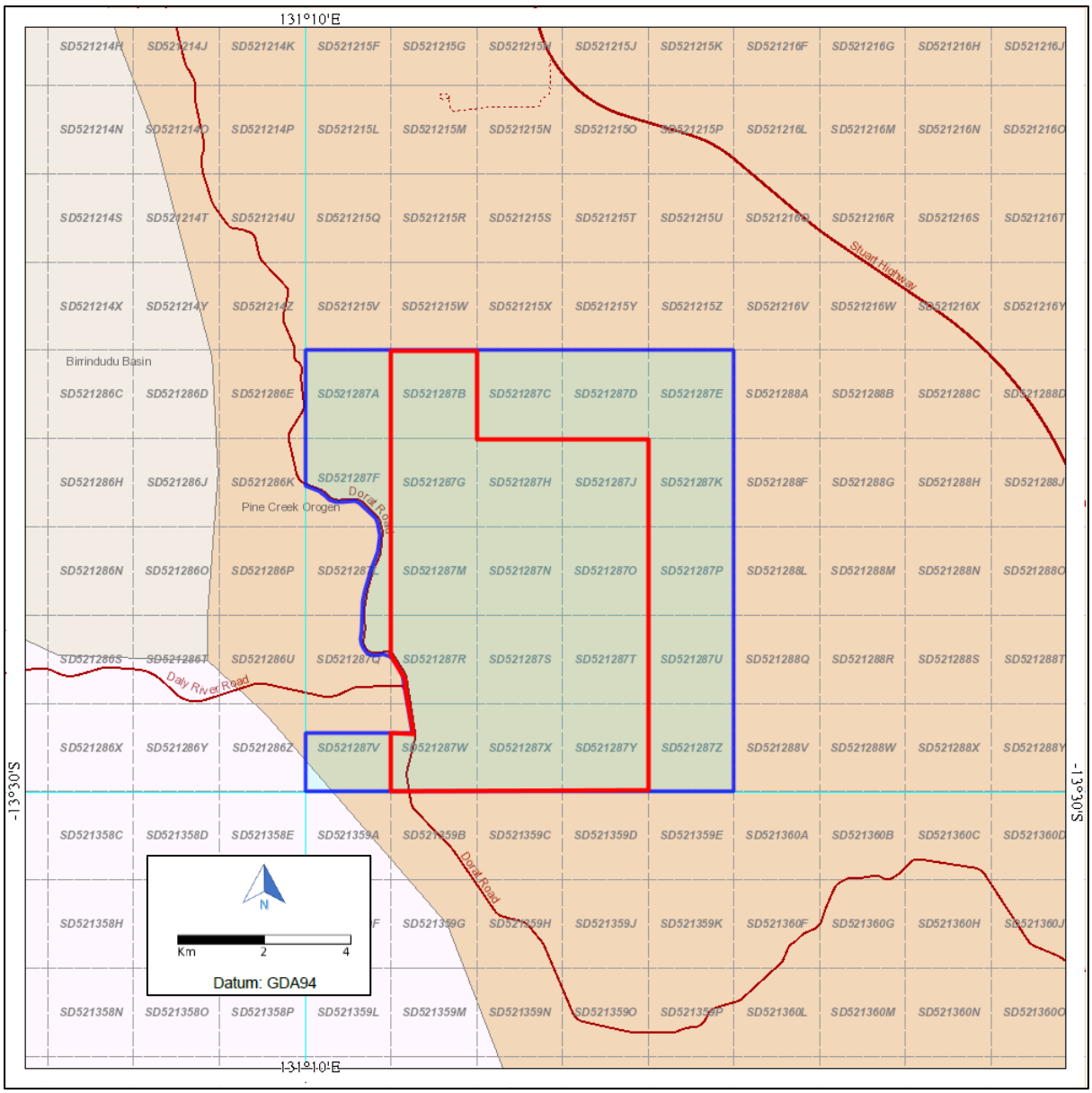


*Figure 2: EL33188 Sub-blocks retained (red) and partially relinquished (blue)*

# 2 GEOLOGY

## 2.1 Regional Geology

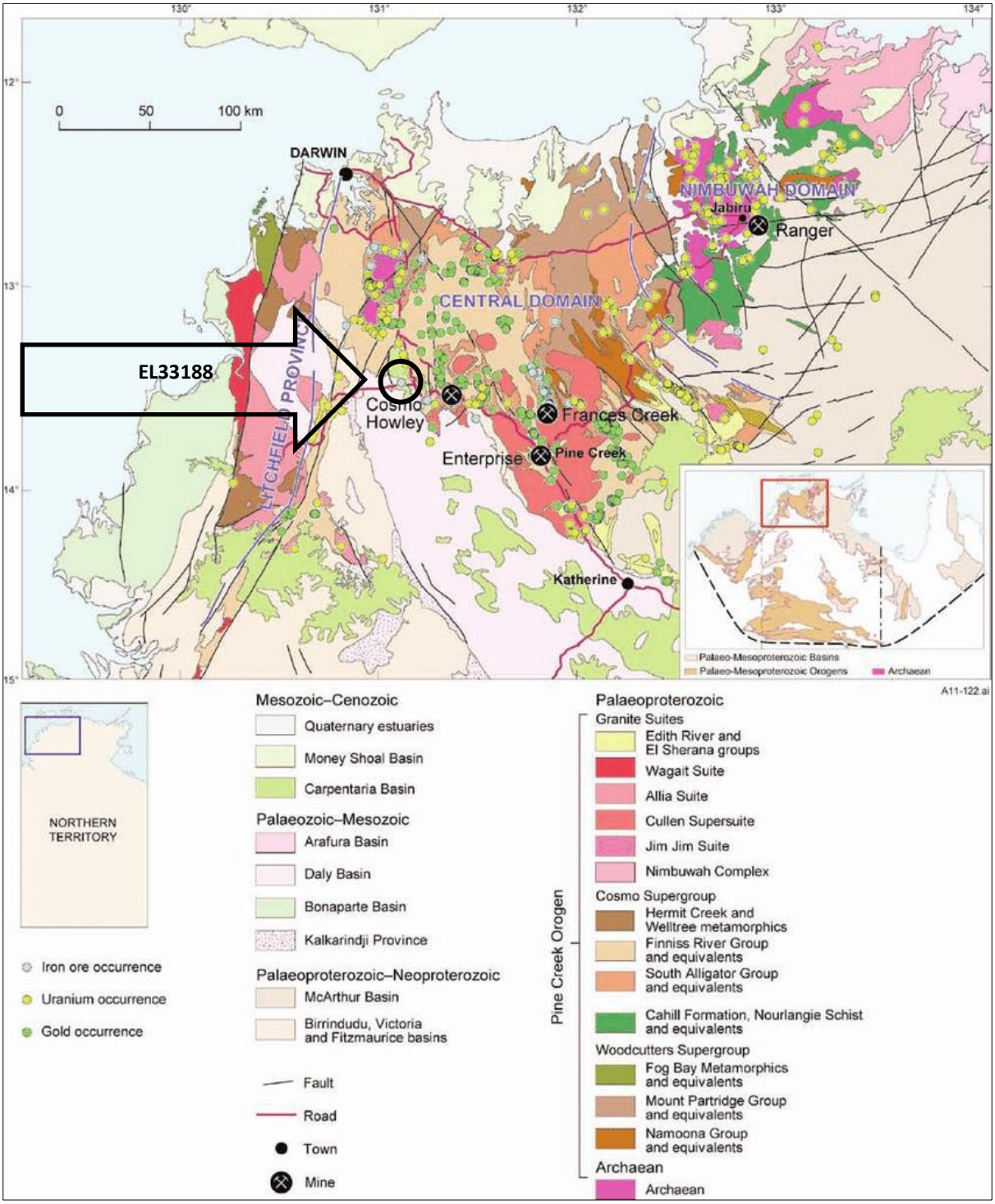


*Figure 3: Generalised Geology of the Pine Creek Orogen (Hollis and Wygralak, 2012)*

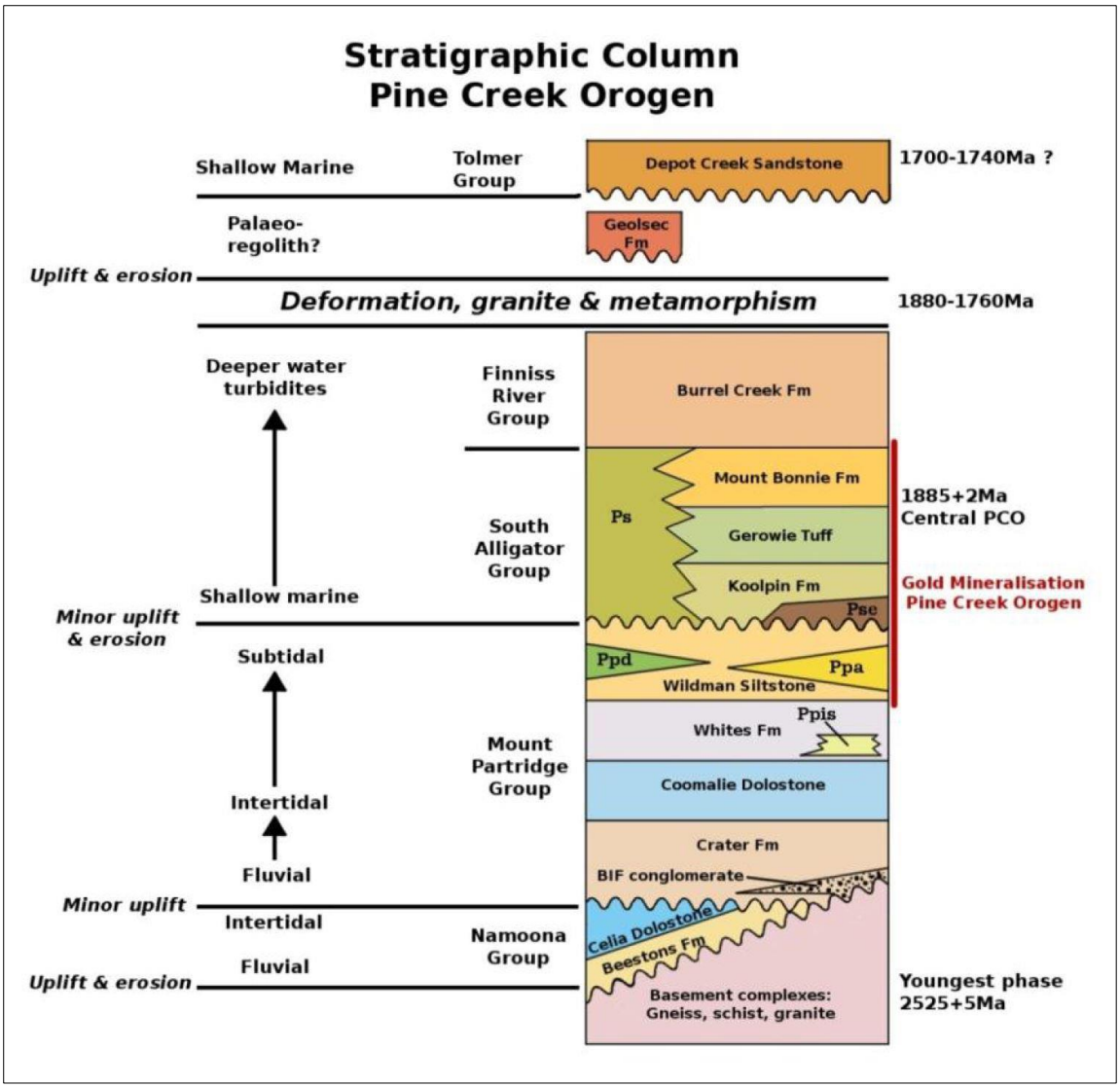


*Figure 4: Stratigraphy of the Pine Creek Orogen*

The Project is located within the Archaean to Paleoproterozoic Pine Creek Orogen (PCO), a deformed and metamorphosed sedimentary basin up to 14 km thick extending over 66,000 km$^2$ from Katherine to Darwin. The orogen comprises Neoarchaean (2670-2500 Ma) granitic and gneissic basement that is unconformably overlain by a thick succession of Palaeoproterozoic clastic, carbonate and carbonaceous sedimentary and volcanic rocks.

The Palaeoproterozoic sequences of the PCO are host to over 1,000 known mineral occurrences, with major commodities including Au, U, Pb-Zn-Ag, PGE, Cu-Co-Ni, Fe ore, Sn-Ta-W, and phosphate (Hollis and Wygralak, 2012).

These rocks experienced regional metamorphism and deformation of varying grades and intensities in different parts of the orogen between 1867-1850 Ma and syn- to post-tectonic granite emplacement from 1830-1800 Ma (Ahmad and Hollis, 2013).

The tightly folded sequence of Lower Proterozoic rocks, 10km to 14km in thickness, were laid down on a rifted granitic Archaean basement between ~2.2-1.87Ga featuring units of the Cosmo Supergroup including the South Alligator Group and Finniss River Group. The stratigraphic sequences are dominated by pelitic and psammitic (continental shelf shallow marine) sediments with locally significant inter-layered cherty tuff units. Pre-orogenic mafic sills of the Zamu Dolerite event (~1.87Ga) intruded formations of the South Alligator Group. During the

Top End Orogeny (Nimbuwah Event ~1.87-1.85Ga) the sequence was tightly folded, faulted and pervasively altered with metamorphic grade averaging greenschist facies with phyllite in sheared zones.

The Cullen intrusive event introduced a suite of fractionated calc-alkaline granitic batholiths into the sequence in the period ~1.84-1.80 Ga. These high temperature I-type intrusives induced strong contact metamorphic aureoles 500m to 2km wide, ranging up to (garnet) amphibolite facies and created regionally extensive biotite and andalusite hornfels facies.

Less deformed Middle and Late Proterozoic clastic rocks and volcanics have an unconformable relationship to the older sequences. Flat lying Palaeozoic and Mesozoic strata along with Cainozoic sediments and proto-laterite cementation overlie parts of the Pine Creek Geosyncline lithologies. Recent scree deposits sometimes with proto-laterite cement occupy the lower hill slopes while fluviatile sands, gravels and black soil deposits mask the river/creek flats areas.

## 2.2 Local Geology

The PCO has been broadly subdivided into three domains from west to east: the Litchfield Province, Central Domain and the Nimbuwah Domain. In addition to differences in metamorphic grade and structural styles, these regions are also distinct in the timing and nature of metamorphism and the timing and chemistry of the main phases of magmatism (Ahmad and Hollis, 2013).

The Project is in the western and central sections of the Central Domain of the Pine Creek Orogen. In the western area the Cambrian Basin cover sequences comprise variable thicknesses of sandstone and shale, with minor limestone in the west and northeast. These rocks unconformably overlie the prospective Paleoproterozoic sequence where South Alligator and Finniss River Group rocks are dominated by mudstones, siltstones, greywackes, sandstones, tuffs, and limestones. The Proterozoic rocks partly outcrop to the east; however, they are concealed at depth to the west where the prospective Koolpin Formation of the South Alligator Group has been intersected in drilling below 30 m to 200 m of Cambrian Daly Basin rocks.

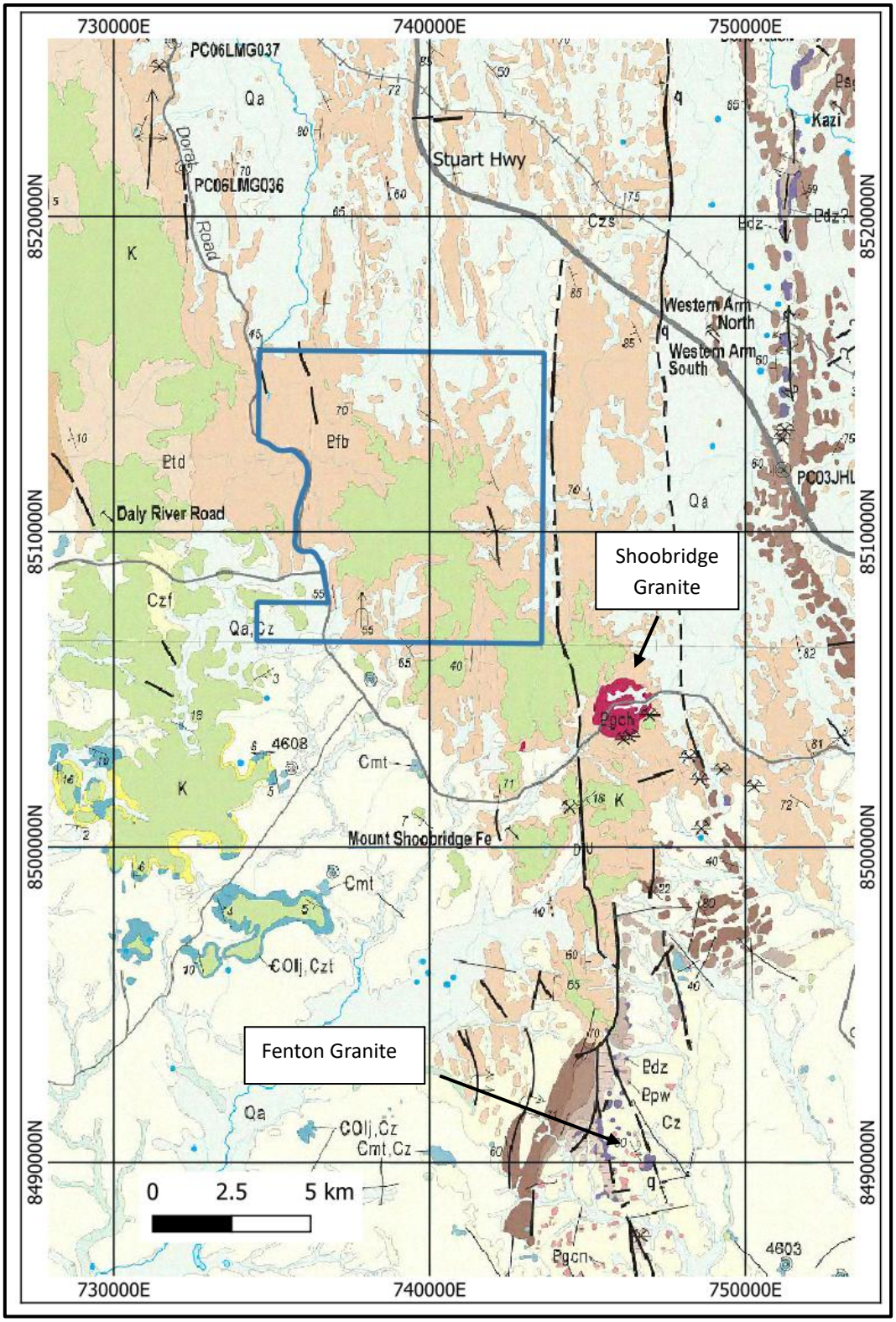


*Figure 5: EL33118 local geology (1:250,000 Pine Creek published geology*

# 3 MINERALISATION

The PCO hosts over a thousand mineral occurrences and is amongst the most prospective geological regions of Australia. Economically, uranium and gold are the most dominant commodities however considerable resources of nickel-cobalt-lead-copper, lead-zinc-silver, platinum-palladium, tin-tantalum-tungsten, iron, magnesite, phosphate, and various other commodities also exist.

Gold mineralisation within the PCO is preferentially developed within strata of the South Alligator Group and lower parts of the Finnis River Group along anticlines, strike-slip shear zones and duplex thrusts located in proximity to the Cullen Granite Batholith (Figures 5 and 6).

The rocks of the South Alligator Group form a distinctive iron-rich sedimentary sequence, unconformably overlying the older rock sequences. The area of the South Alligator Group includes the basal Koolpin Formation, which is overlain by the Gerowie Tuff, which is conformable with the Mount Bonnie Formation (Refer Figure 4). The Gerowie Tuff and overlying Mount Bonnie Formation are similar in composition and may act as a stratigraphic seal for gold mineralisation found in the ferruginous and carbonaceous rocks of the underlying and preferentially mineralised Koolpin Formation (Bajwah, 1994).

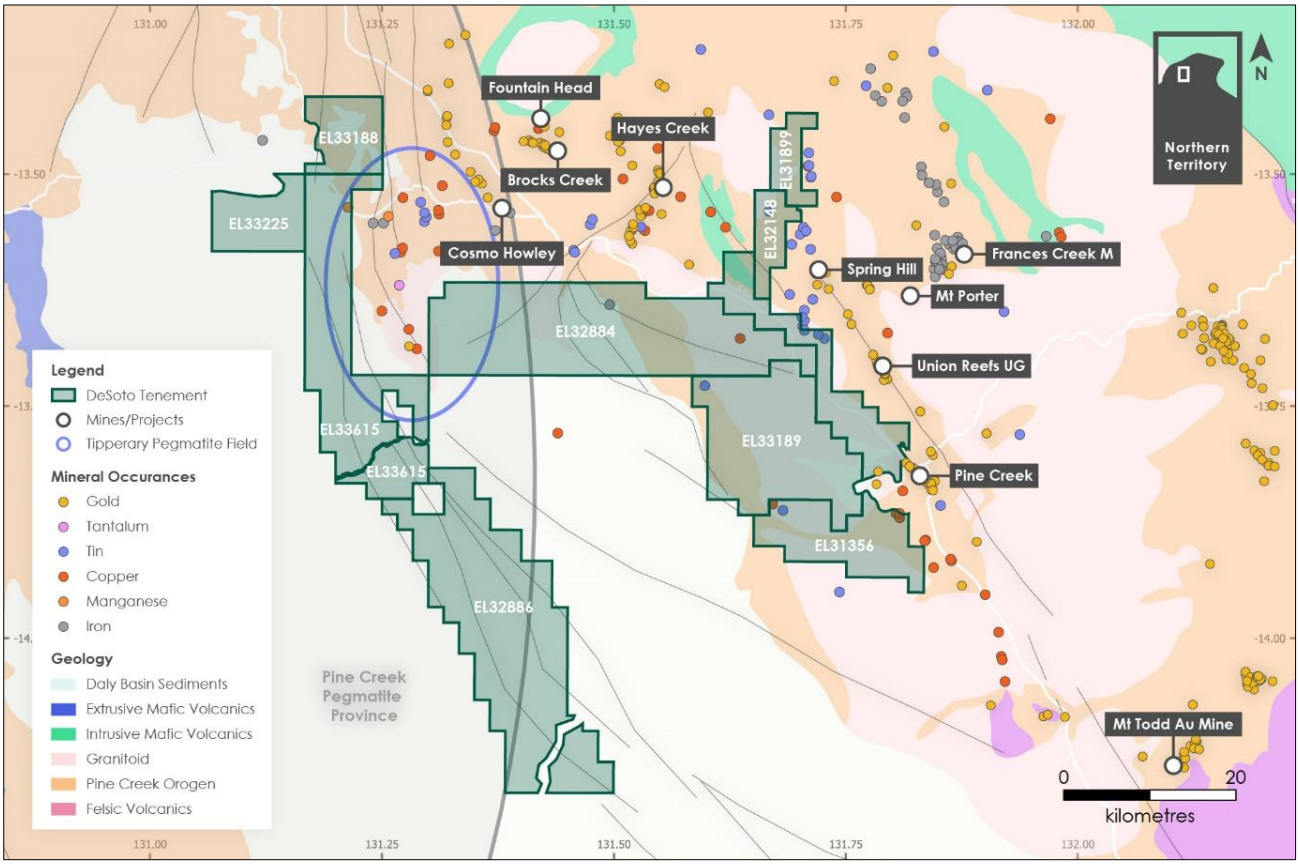


*Figure 6: Regional Geology and Gold Mineralisation*

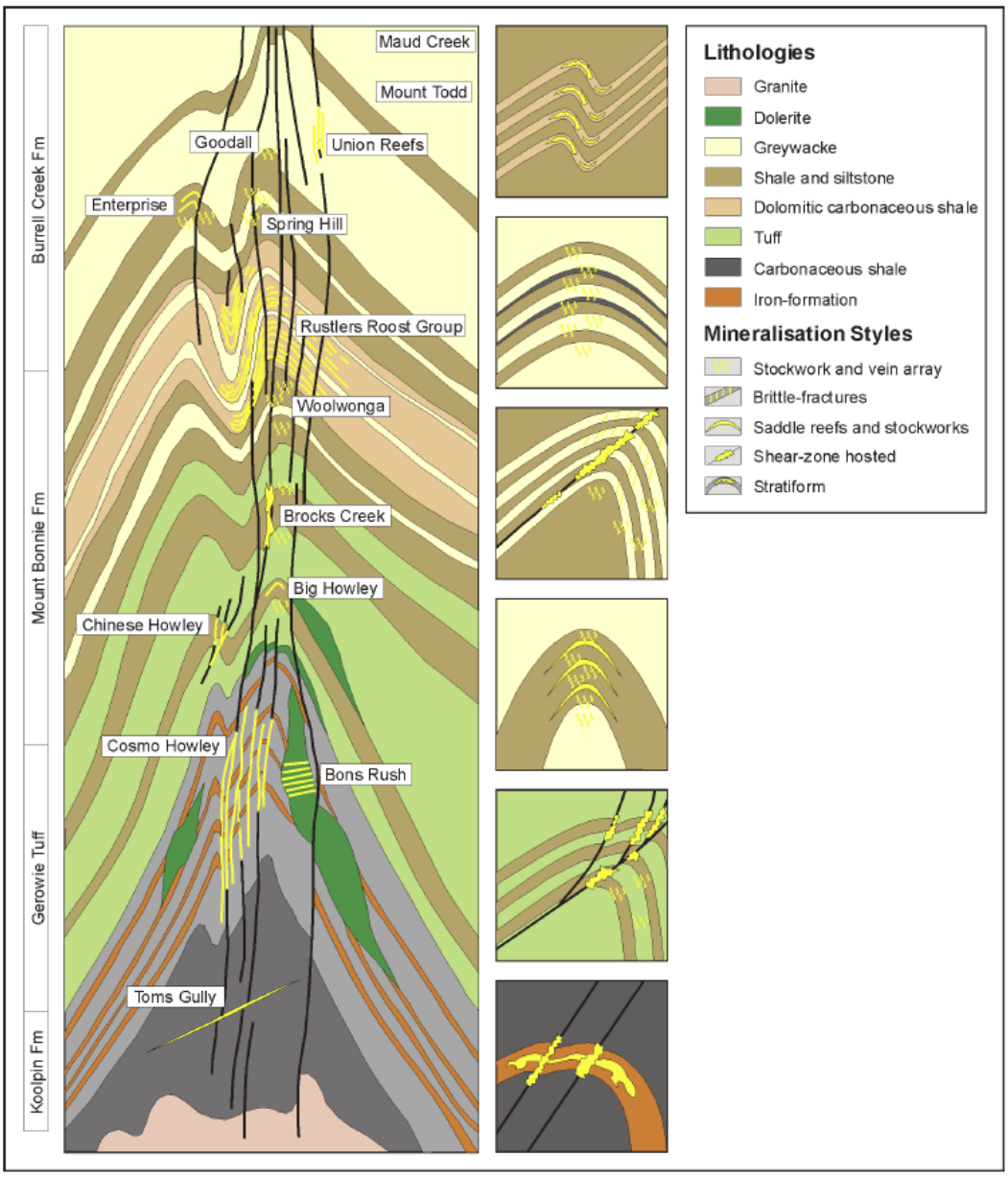


*Figure 7: Mineralisation Styles of the Pine Creek Orogen*

# 4 EXPLORATION RATIONALE

The Dorat (Shoobridge West) area is prospective for gold as it covers an extension of a regional fault known to host gold mineralisation further south in the Shoobridge area and to the north of the tenement at Mt Tymn. Mangusta have interpreted the area to be part of the gold prospective Fenton Shear Zone (FSZ) corridor with favourable Finniss River Group stratigraphy outcropping (Figure 4 & 7).

The area is also prospective for stratiform manganese mineralisation with the Green Ant manganese occurrence just to the south of the tenement with the host stratigraphy running north into the tenement area.

In addition to gold and manganese, Mangusta is assessing the area's lithium potential due to the proximity of Mt Shoobridge to the southeast where tin-tantalum occurs.

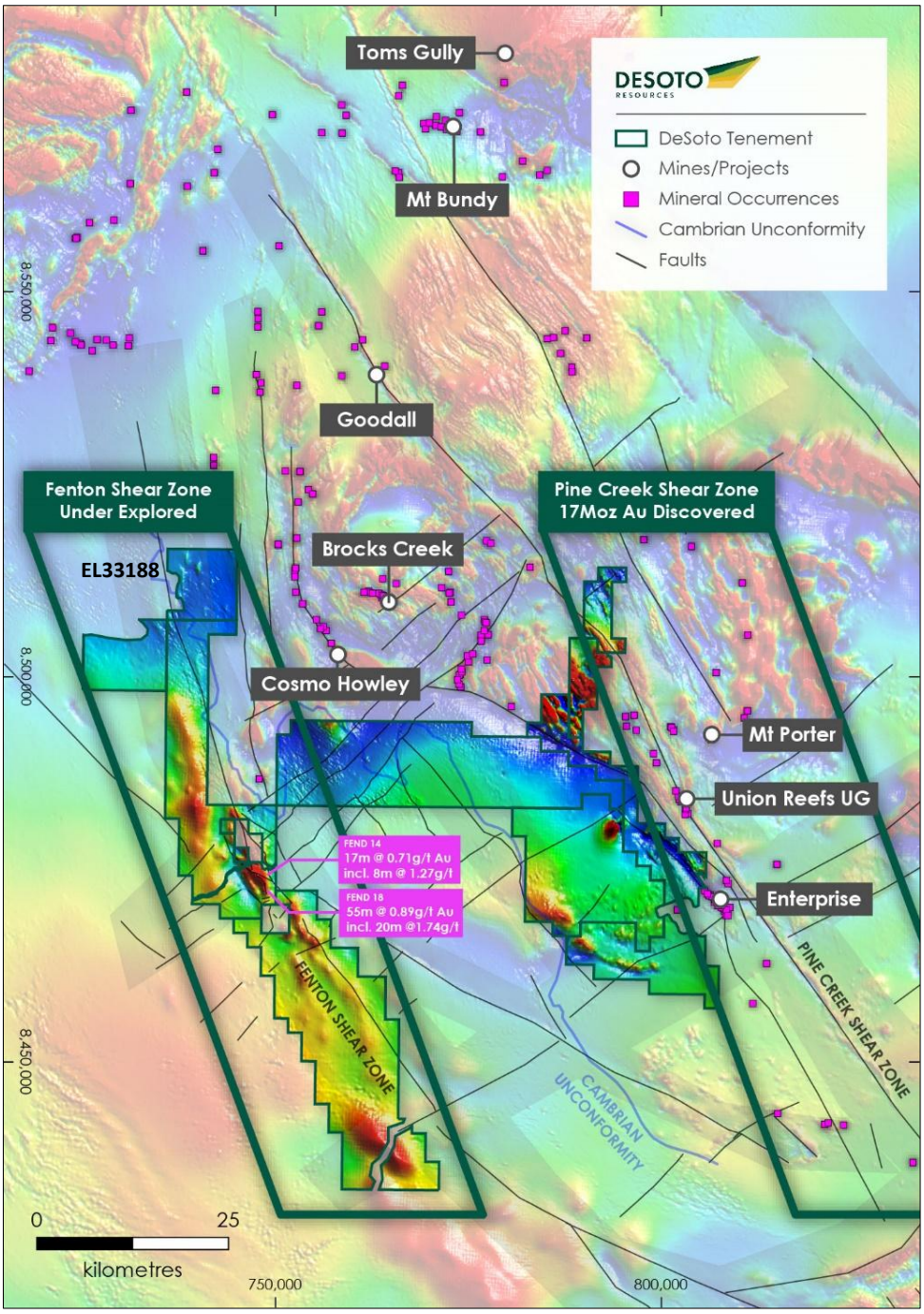


*Figure 8: Fenton Shear Zone on magnetics*

# 5 PREVIOUS EXPLORATION

The Dorat licence occurs within the potential northern extension of the substantially under-explored regional-scale Fenton Shear Zone (FSZ) corridor, located west of the Pine Creek Shear Zone, which hosts many known gold deposits. The FSZ was not seriously explored until regional programmes were carried out in the 1990s.

Previous exploration in the Dorat area includes Australian Coal and Gold Holdings (1984-1986) who collected 2 stream samples in EL33188 (BC03 & BC05) with BC03 reporting a best result of 44ppm Zn (BC03; CR1986-0138). Coronation Hill Gold Mines (CR1988-0383), Nullarbor Holdings (CR1993-0394) and Tipperary Mining (CR1991-0438) also completed small stream sediment sample programs within the region. Newmont Australia (CR1990-

0378) collected soils and rock chips to the south outside the current tenure area. The majority of previous exploration in the current tenure area has been conducted by Dominion Gold Operations Pty Ltd (Dominion) between 1990-1994.

Dominion conducted mapping, rock, soil and stream sampling while exploring for gold and base metals over a large area that now includes EL33188. In conducting stream sampling Dominion collected two sample types; A – 20 mesh silt fraction (sieved to -200 micron in the laboratory), and B – heavy pan-concentrates (100g). Drainage samples were collected at a sample density of 1 sample per 4km$^2$.

The stream pan-concentrate sampling produced 4 high-grade gold assays at the Barrapool prospect, all within close proximity of each other in the current tenure, including best results of 257 g/t Au (706015B) and 53g/t Au (286511B; Table 2, Figure 8). Follow-up field pan-concentrate resampling of 2 of the high-grade locations confirmed anomalous gold with 700267B reporting 0.39g/t Au (initial sample 53g/t Au), and 700268B reporting 46 g/t Au (initial 2.33g/t Au). These samples also demonstrated the expected variability of grade due to the coarse gold nugget effect of the sampling method.

A best result of 40ppb Au (286510A) was reported from the -200 micron silt fraction of the stream sediment samples showing some anomalism in the fine fraction, but in general most fine samples were not anomalous.

Further follow-up and infill exploration of the anomalous streams and secondary drainages was completed in 1993 with 28 low detection level BLEG samples, and 13 soil sampling traverses completed. No significant results were reported from these fine sediment sampling methods however a slightly elevated 2ppb Au anomaly does seem to occur proximal to interpreted anticlinal fold axes within prospective Burrell Creek Formation sediments, a favourable location for Pine Creek style gold mineralisation. Although further work was recommended, none was conducted.

Subsequent explorers in the area have noted Dominion's results in passing but as the high-grade pan-concentrate results were not highlighted in reports and the data was not digital, the pan-concentrates have largely been ignored.

The Barrapool prospect is a strong gold target in a highly prospective part of the Pine Creek Orogen that has not been explored by modern day gold exploration techniques.

*Table 2: Barrapool significant Dominion stream sample results (source CR1993-0010)*

| Sample No. | Au g/t B (Pan-Concentrate) | Au ppb A (-200 micron) | Easting (GDA94) | Northing (GDA94) |
|---|---|---|---|---|
| 706015 | **257** | 1 | 736554 | 8512127 |
| 286511 | **53** | 2 | 736348 | 8512411 |
| *700268#* | *0.39* | *1* | | |
| 286510 | **2.33** | 40 | 736346 | 8512474 |
| *700267** | ***46*** | *<1* | | |
| 706014 | **3.3** | 1 | 736602 | 8512184 |

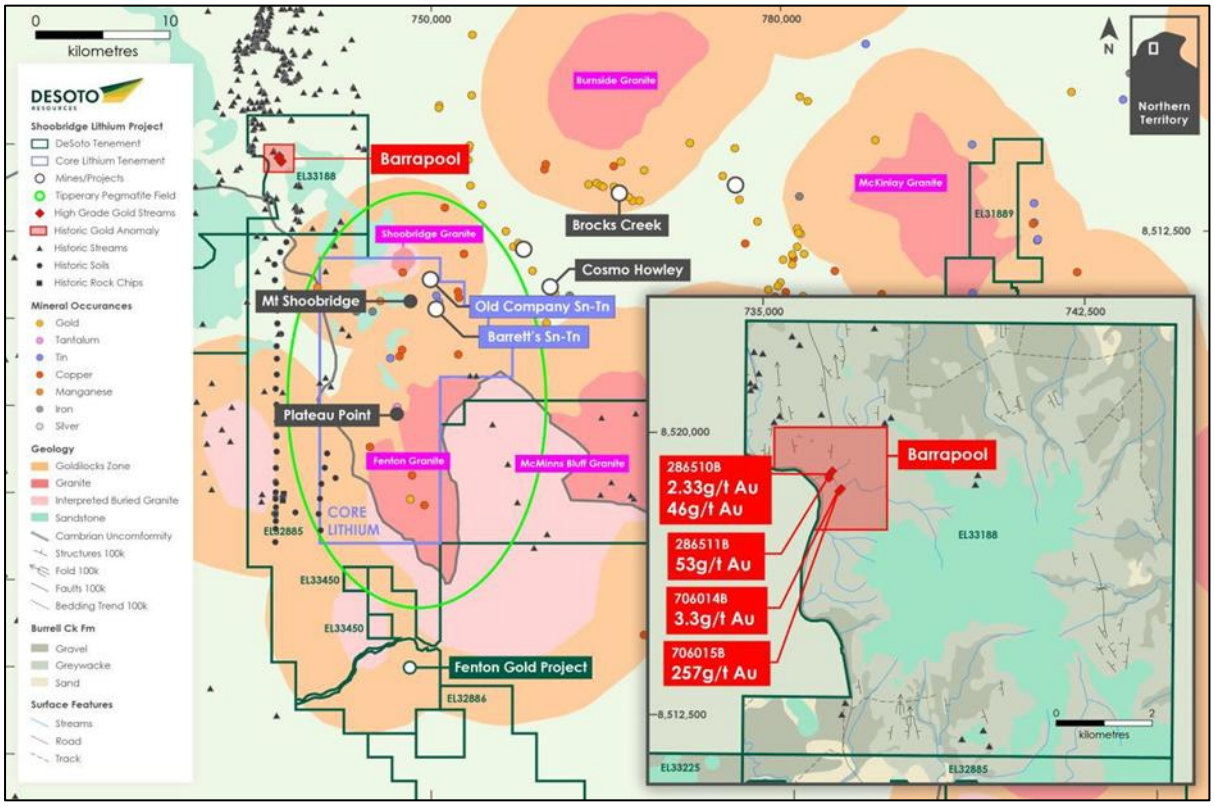


*Figure 9: Barrapool Prospect with inset map showing historic gold pan-concentrate stream sediment results*

Sample locations were obtained by digitising historical maps and sample positions using the old tenement boundaries and may be +/- 10m.

# 6 WORK COMPLETED DURING TENURE

Exploration activities completed by Mangusta Minerals includes reconnaissance mapping. Stream and rock sampling.

## 6.1 Reconnaissance Mapping and Sampling

In 2022 Mangusta commenced an initial reconnaissance mapping and sampling program targeting Lithium Caesium Tantalum (LCT) pegmatites. A well-developed stream network over the Proterozoic Birrindudu Basin and Pine Creek Orogen sediments and granites was identified in the project area. The stream network incises outcropping granites and sediments, along with areas of shallow sand cover. The position of these sands in the landscape suggested that they are colluvial rather than alluvial and that they would be appropriate for first pass stream sediment sampling. Elevated remnants of an older lateritic land surface located in EL33188 were assessed to require rock and soil sampling.

The first pass stream sampling program was designed with a sample density of 1 sample per 2.8sqkm over catchments in EL33188, for a total of 15 samples in the relinquished area. In addition to the streams a total of 5 rocks comprising were also collected from the area (Figure 10). Streams were analysed for a 61 multi-element suite including rare earths (ME-MS61r) to assess granite prospectivity and fertility for lithium mineralisation (LabBatch AD23180351). Rock samples were analysed for trace level Au (Au-TL43) and multi-elements Cu, Pb, Zn, As, Ag, Sb, Bi & Mn (ME-ICP43) in LabBatch AD23180363. Sample and assay data are provided in Appendix 1.

In the stream sediment sampling no significant granite fertility ratios or lithium mineralisation were reported.

A best result of 8ppb Au was reported from a quartz vein rock sample (23010) approximately 600m from the eastern boundary of the licence. All other rock samples assayed below 1 ppb Au including four samples (23004-7) that were collected in the Barrapool area.

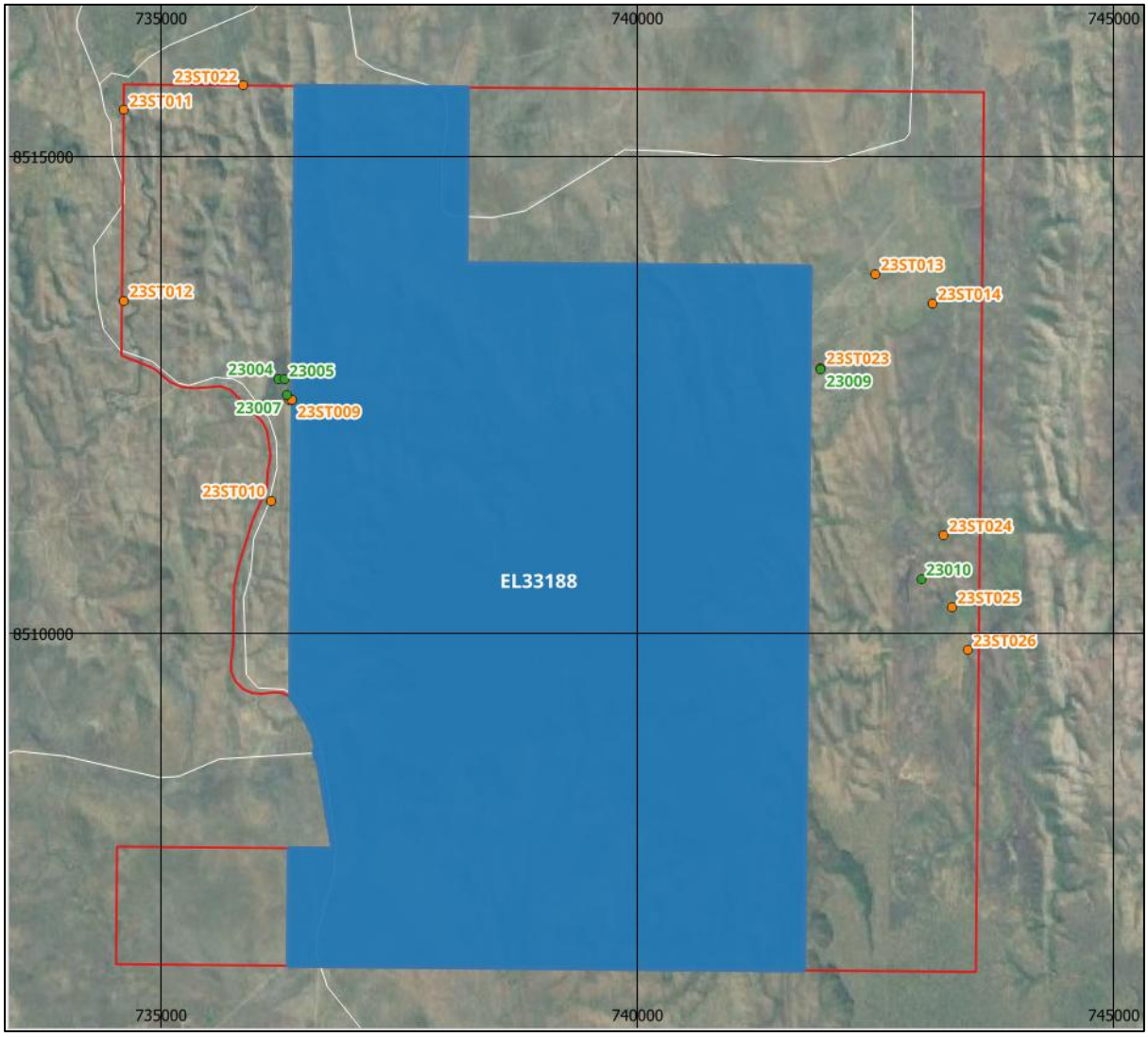


*Figure 10: Rock (green) and stream (orange) sample locations in relinquished area (red outline)*

# 7 CONCLUSIONS AND RECOMMENDATIONS

Exploration activities have included an assessment of the geology and regolith domains to determine the appropriateness of stream sediment sampling for lithium exploration, historical data compilation, and a surface geochemical sampling program comprising streams (12) and rocks (5). No significant lithium mineralisation was encountered.

An assessment of existing geological and geophysical datasets suggests that the relinquished blocks have significant thicknesses of Cambrian Limestone, Cretaceous and younger cover rocks overlying the Proterozoic basement and have low potential to host economic gold, base metal or lithium mineralisation. No further work is recommended on these blocks, and they have been relinquished.

# 8 REFERENCES


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CR1993-0394 Nullarbor Holdings.