Title Holder	Territory Iron Pty Ltd
Operator	Territory Iron Pty Ltd
Tenement Manager / Agent	Linda Glass Tenement and Rehabilitation Manager  Territory Iron Pty Ltd
Titles / Tenements	EL24040
Mine / Project Details	Frances Creek
Reporting Title	Annual Report for the Period 19 <sup>th</sup> August 2014 – 13 <sup>th</sup> July 2015
Personal Authors	Linda Glass – Tenement and Rehabilitation Manager
Corporate Authors	Territory Iron Pty Limited
Company Reference Number	
Target Commodity	All minerals except Au
Report Date	18 <sup>th</sup> October 2015
Datum / Zone	GDA94 / Zone 52
250k Mapsheet	Pine Creek SD52-08
100k Mapsheet	McKinlay River 5271
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# TERRITORY IRON PTY LIMITED A.C.N. 125 984 401

# **EL24040**

Pine Creek SD52-08 1:250,000 Geological Map Sheet McKinley River 5271 1:100,000 Geological Map Sheet

# **NORTHERN TERRITORY**

LM Glass October 2015

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# **SUMMARY**

This report describes exploration activities conducted on Frances Creek tenement EL24040 by operator Territory Iron Pty Ltd from 19<sup>th</sup> August 2014 to 13<sup>th</sup> July 2015. The report only covers the period to the 13<sup>th</sup> July 2015 (instead of 18<sup>th</sup> August 2015) as EL24040 underwent a partial relinquishment (see Glass, 2015) to surrender 13 blocks. Six graticular blocks, however, were retained and amalgamated with a single graticular block from adjoining tenement EL29015 to form new tenement EL30832. The Notice of Intention to Issue Replacement Title (dated 2<sup>nd</sup> July 2015) was granted for EL30832 on the13<sup>th</sup> July 2015. Upon grant of EL30832, the six retained blocks of EL24040 were automatically cancelled.

Exploration activities during the reporting year included desktop studies to evaluate the iron ore and manganese potential and earthworks and rehabilitation of earlier drill sites.

Expenditure for the reporting year on EL24040 was \$152,410.

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### 1.0 Introduction, Location and Access

This report details exploration activity for iron mineralisation conducted by Territory Iron Pty Ltd within tenement EL24040 during the 19<sup>th</sup> August to 2014 to the 13<sup>th</sup> July 2015 up until the time of cancellation and amalgamation of retained graticular blocks with those retained of EL29015 to form new tenement EL30382. EL24040 is an exploration lease within the Frances Creek Project Area in the Pine Creek Orogen in the Northern Territory. The Frances Creek Project Area is located about 220km south of Darwin and ~23km north of Pine Creek town ship, Figure 1.

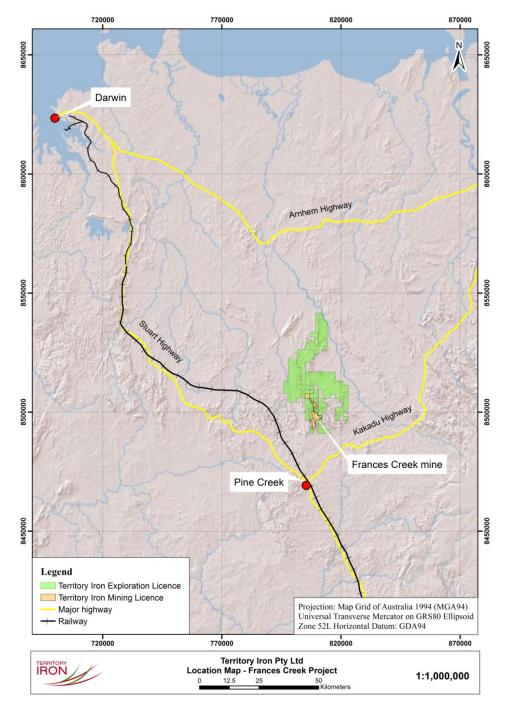
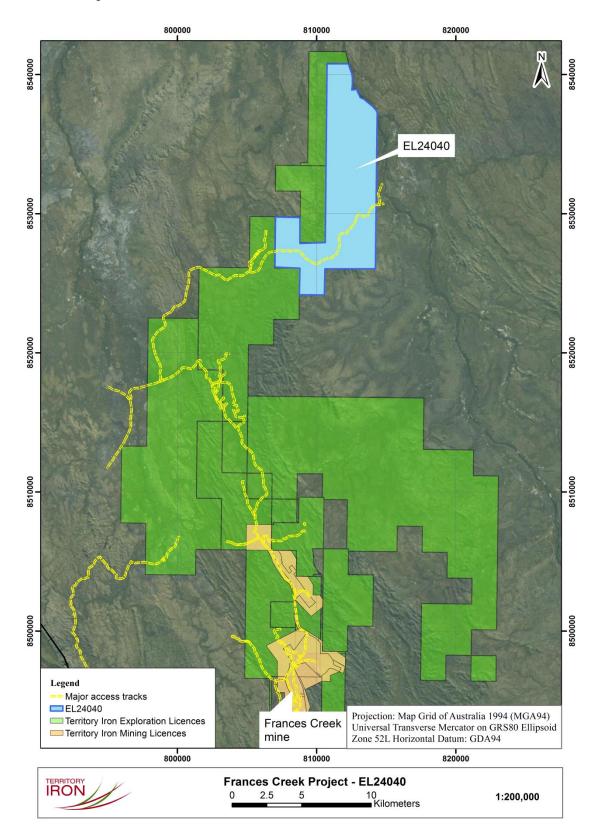


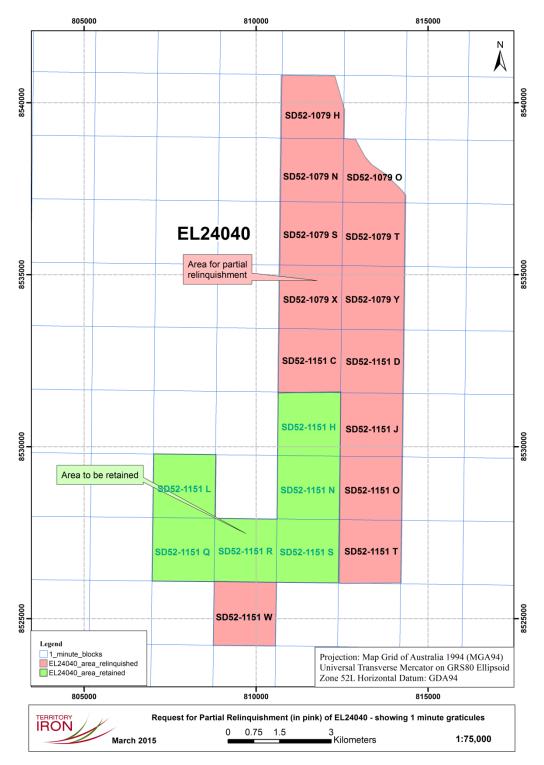
Figure 1: Location Map of Frances Creek Project with ESRI world shaded relief defining background topographic elevation. Beige polygons represent Frances Creek Mining Leases and green polygons represent Exploration Licences (the remainder of the Frances Creek Project Area)

EL24040 is located about 30 km north of the current Frances Creek mining operations, Figure 2. Access to the tenement is via a graded track north of the mine.



**Figure 2:** Location map of EL24040 prior to partial relinquishment (blue polygon) and Frances Creek mine site. ESRI world satellite imagery defines background relief.

Exploration Licence 24040 was partially surrendered on the 7<sup>th</sup> May 2015. Figure 3 shows the graticular blocks of EL24040 that were retained (in green) and those relinquished (in pink) on the 7<sup>th</sup> May 2015. The retained green blocks were amalgamated with 1 graticular block of EL29015 (which also underwent a partial surrender) to form new tenement EL30832 which was granted on the 13<sup>th</sup> July 2015. Upon grant of EL30832, the six remaining graticular blocks of EL24040 and single graticular block of EL29015 were cancelled.



**Figure 3:** Partial Relinquishment of EL24040 showing graticular blocks (in pink) to be relinquished and blocks to be retained to form part of new tenement EL30832 (in green)

#### 2.0 TENURE

#### 2.1 MINERAL RIGHTS

Territory Iron Pty Ltd submitted an application for tenement EL24040 on the 23<sup>rd</sup> September 2003. The tenement was granted on the 19<sup>th</sup> August 2004 for a term of six years. Following the six year expiry, two renewals for EL24040 were approved with the expiry date set to 18<sup>th</sup> August 2014. A further renewal for an additional two years was submitted on the 7<sup>th</sup> August 2014.

#### 2.2 LAND TENURE

Land tenure under the title is within Ban Ban Springs Pastoral Lease, PPL 1111 – NT Portion 695, owned by Ban Ban Springs Station Pty Ltd, PO Box 7207, St Kilda Road, Melbourne, Vic 8004.

#### **2.3 Native Title Act 1993**

A registered native title claim DC01/21 lodged on the 13<sup>th</sup> March 2001 (Paddy Huddleston & Ors) – PPL 1111 covers the pastoral lease.

#### 3.0 CULTURAL HERITAGE MANAGEMENT

Seven archaeological sites are recorded in the retained graticular blocks of EL24040. These sites remain protected under the provisions of the *Heritage Act* 2012.

More recently, in December 2013, Territory Iron was issued a permit under Section 72 of the Act to disturb sites throughout the entire Frances Creek project area if required for mining activities or exploration. However, sites will only be disturbed if absolutely necessary. Territory Iron archaeologists supervise any heritage management activities in accordance with the requirements of the permit. An Authority Certificate under the NT Aboriginal Sacred Sites Act 1989 will only be issued should the area ever be mined.

#### 4.L: REGIONAL GEOLOGY

The Frances Creek mine site and adjacent exploration area are located within the Palaeoproterozoic Pine Creek Orogen which forms part of the North Australian Craton. The Pine Creek Orogen covers an area of ~50,000 km2 and represents a >4 km succession of carbonate, clastic and carbonaceous sedimentary and volcanic rocks, which unconformably overlie Neoarchaean (~2500 Ma) basement granite and gneiss. Based on the timing of sedimentation, magmatism and metamorphism, the Pine Creek Orogen has been divided into three distinct domains, from west to east; the amphibolite to granulite facies Litchfield Domain, the greenschist facies Central Domain and the amphibolite facies Nimbuwah Domain. The Frances Creek mine site and adjacent exploration area is located within the Central Domain.

The oldest rocks (the Palaeoproterozoic Woodcutters Supergroup) comprise the Namoona Group (Masson Formation) to the east of the Frances Creek project area. They are unconformably overlain by the Mount Partridge Group (Mundogie Sandstone and Wildman Siltstone) which cover the majority of the Frances Creek project. The Mundogie Sandstone (Mount Partridge Group) forms prominent continuous northwest-striking ridges of dominantly coarse, pebbly, feldspathic quartzite and arkosic sandstone (Stuart-Smith *et al.*, 1987). Massive, graded beds of pebble conglomerate are common and units often display graded bedding and lenticular cross-bedding. Subsequent to sedimentation of the Mundogie Sandstone, the Wildman Siltstone (subdivided into two

members; the Lower Wildman Siltstone and Upper Wildman Siltstone) were deposited with apparent conformity. The unit mainly comprises metapelitic assemblages with subordinate sandstone. The Lower Wildman Siltstone is host to the majority of the iron mineralisation at Frances Creek.

In the western portion of the Frances Creek project area, the Mt Partridge Group is unconformably overlain by the stratigraphic sequences of the Cosmo Supergroup, comprising the South Alligator Group (Koolpin Formation, Gerowie Tuff and Mt Bonnie Formation) stratigraphic sequence. Subsequent to deposition of these units, preorogenic Zamu Dolerite sills intruded these stratigraphic successions.

Syn- to post-orogenic activity is represented by intrusion of the 1835-1800 Ma Cullen Supersuite granitoids. Intrusion of the granite led to contact aureoles in the surrounding pre-orogenic Masson Formation, Mundogie Sandstone and Zamu Dolerite.

Two major episodes of folding are recognised, earlier tight to isoclinal F1 folds followed by younger open (widely spaced) folds (Stuart-Smith *et al.*, 1987). The major structural controls in the tenement area are related to D3 1-3 km scale northwest-trending non-cylindrical folds, which plunge gently to the northwest to form a series of anticlines and synclines pre-dating the intrusion of the Cullen Supersuite, and 1-3 km long northwest and northeast-trending faults.

#### 4.2: LOCAL GEOLOGY AND MINERALISATION

The main stratigraphic units in the relinquished portion of EL24040 are the Mundogie Sandstone and Wildman Siltstone of the Mount Partridge Group, the Koolpin Formation of the South Alligator Group and the Minglo Granite of the Cullen Supersuite, Figure 4. Unconsolidated quarternary sedimentary deposits cover a large portion of the area.

In the Frances Creek area, economic grade iron mineralisation is concentrated primarily within basal breccias of the Lower Wildman Siltstone, within regional fold hinge zones and limbs of overturned NNW-trending, shallow plunging, non-cylindrical folds and subordinate parasitic folds and fold flexures. The lower sequence consists of carbonaceous phyllite, ironstone, siltstone and phyllite which is overlain by laminated grey, brown, red and cream banded siltstone (Stuart-Smith *et al*, 1987). At depth, the sequence grades into pyritic carbonaceous shale. The lower member in surface outcrop consists of bleached white to grey carbonaceous shale including highly angular iron-rich breccias and massive ironstone, overlain by laminated grey, brown, red and cream shale and siltstone.

Although not recognized in the official stratigraphic definition for the Wildman Siltstone, drilling at Frances Creek has revealed extensive dolostone in the lower member. Iron enrichment is not restricted to one stratigraphic unit and occurs in strata both above and below the Wildman Siltstone, although these enrichments do not reach economic levels. A characteristic feature of the Frances Creek deposit is that is that high-grade zones comprise numerous, small, irregular, "pod-like" ore bodies that are of the order of 10 – 20 m in diameter and generally within 100 m of the contact to the underlying Mundogie Sandstone.

Iron-bearing oxides include hematite ( $Fe_2O_3$ ) and goethite (FeO(OH)) ± accessory manganese minerals which are associated with goethite. High grade Fe-ore (>65 %Fe) is characterized by hard, grey, massive hematite or friable purple, microplaty hematite. These ores can range from extremely fine grained to coarse grained and bladed with numerous irregularly shaped vugs and skeletal-textures reminiscent of boxworks, in which vugs are often filled with late-crystallising, coarse-grained hematite. Goethite occurs as both ochreous and vitreous forms.

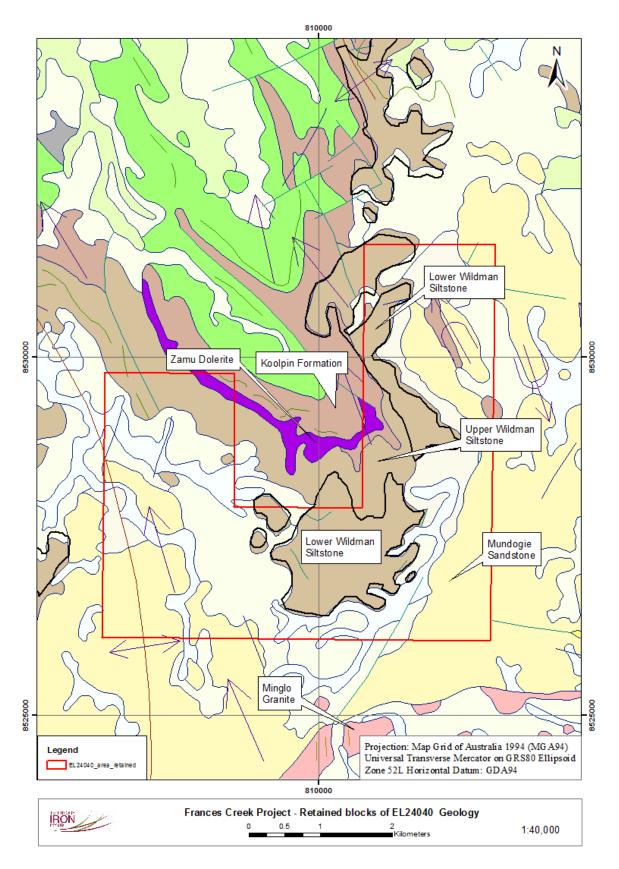


Figure 4: Geology of retained blocks EL24040

# 5.0: EXPLORATION ACTIVITIES - CURRENT REPORTING YEAR

Exploration activities during the reporting year included desktop studies to evaluate the iron ore and manganese potential and a reconnaissance field trip to monitor the rehabilitation of earlier drill sites.

# 6.0: CONCLUSIONS AND RECOMMENDATIONS

An in depth review of the geophysical data (airborne EM and ground gravity surveys) and a follow up reconnaissance programme involving rock-chip sampling is recommended for the retained portion of former tenement EL24040 (now part of EL30832).

#### 7.0: REFERENCES

Glass LM, 2014. Territory Iron Pty Ltd, *EL24040 Annual Report for the period 19<sup>th</sup> August 2013 – 18<sup>th</sup> August 2014.* 

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