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**COMBINED ANNUAL REPORT FOR THE  
NORTHERN PROJECT AREA  
GR057/12**

**16 AUGUST 2014 – 15 AUGUST 2015**

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## 1. SUMMARY

Exploration Licences (EL's) in the Northern Project Area (NPA) were acquired by Giants Reef Exploration Pty Ltd (Giants Reef) to search for Tennant Creek style iron oxide copper-gold deposits. Giants Reef is a wholly owned subsidiary of Emmerson Resources Ltd (Emmerson).

This combined report records the exploration work completed on these EL's during the NPA Combined Reporting period from 16 August 2014 to the 15 August 2015.

During the reporting period exploration activities were very limited due to corporate reasons, which entailed the seeking of a Joint Venture (JV) Partner or further funds to continue exploration in the Tennant Creek area and more specifically the NPA. Emmerson succeeded in securing Evolution as a Joint Venture Partner who has committed to spend \$25M over the next 5 years.

Following the formation of this JV, Emmerson commenced exploration activities centred around the re-evaluation of the potential for gold deep under the historical Gecko Mine. Although the hole was drilled in ML23969 it has implications for a more regional picture that extends from this ML into EL's of the NPA and will be described below.

Emmerson completed a seismic survey over the Historical Gecko Mine, more specifically the K44 ore body aimed at trying to resolve and deep targets previously not seen by other depth limited geophysical techniques and now past deep drilling.

The seismic section was interpreted by Emmerson and our JV partners geoscientists and a target was generated, figure 9 displays the plan view of the drilled hole (GODD032) and also a further proposed hole that has not been drilled to date, figure 10 displays the seismic section and the significant intercepts.

Emmerson drilled 1 deep diamond (DDH) hole, with an RC precollar under the historical Gecko mine (ML 23969) totalling 1,279m (of which 265m was an RC precollar and 1,014m was DDH).

Results from the drilling was mixed with high grade copper intersected in the RC precollar, with best results as below;

- o 7m at 5.98% Cu from 123m including 3m at 10.4% Cu
- o 3m at 4.75% Cu from 162m including 1m at 10.6% Cu
- o 1m at 2.37% Cu from 221m

The deeper results were disappointing but some remain outstanding.

The copper intersected in the top part of the hole potentially could be a western strike extension of Emmerson's Goanna discovery located 800m to the east. A proposal for a drill program to confirm this extension will be prepared and tabled at the next JV meeting in late October 2015, for drilling in late 2015 or early 2016.

Total expenditure on the NPA during the reporting period was \$501,068.56 versus a minimum expenditure (as per guideline 6) of \$219,750.00.

## 2. INTRODUCTION

EL's in the NPA, were acquired by Giants Reef to search for Tennant Creek style iron oxide copper-gold deposits. Giants Reef is a wholly owned subsidiary of Emmerson.

This combined report records the exploration work completed on these EL's during the NPA Combined Reporting period from 16 August 2014 to the 15 August 2015.

On the 6 August 2005 the Manager of Customer Services – Minerals & Energy Titles (now the Department of Resources (DoR)) approved the Company's request to combine its EL's and SEL's into four (4) project areas for purposes of combined annual reporting. The 4 areas are divided into the Northern, Southern, Eastern and Western regions, each initially averaging around 750km<sup>2</sup>, but now range between 293km<sup>2</sup> and 535km<sup>2</sup>. Details of the EL's under the NPA are outlined in Section 4 Tenure.

The aim of creating the 4 tenement groups is to simplify tenement statutory reporting and project management, and also more clearly convey exploration expenditure aligned to the Company's project work areas, which are not restricted to individual tenements.

## 3. LOCATION

EL's making up the NPA cover an area of some 755.22km<sup>2</sup> north of the Tennant Creek Township.

The principal access to EL's in the NPA from Tennant Creek is north via the Stuart Highway, then east and west by various unsealed roads, tracks and fence line tracks. However, much of the Project area is rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 1 shows the location of the EL's within the NPA with respect to the town of Tennant Creek.

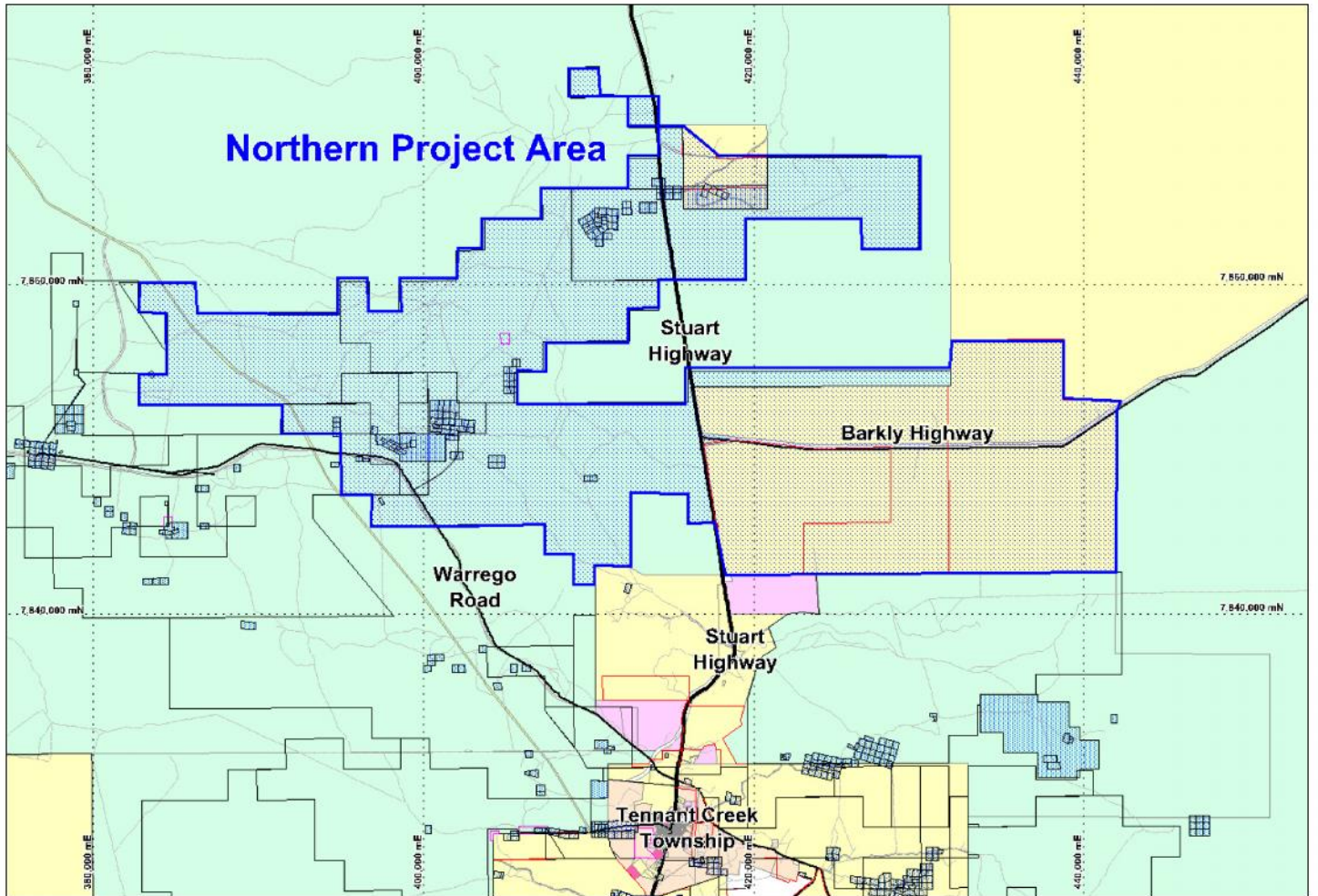


Figure 1: NPA

### 3.1 EL 26594 BILLS

EL 26594 BILLS is located between approximately 39km and 50km north of Tennant Creek Township, on the Flynn (5759) 1:100 000 scale map sheet.

The principal access to the general license area from Tennant Creek is north via the Stuart Highway which bisects the licence, and then east or west by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 2 shows location EL 26594 with respect to the Tennant Creek Township.

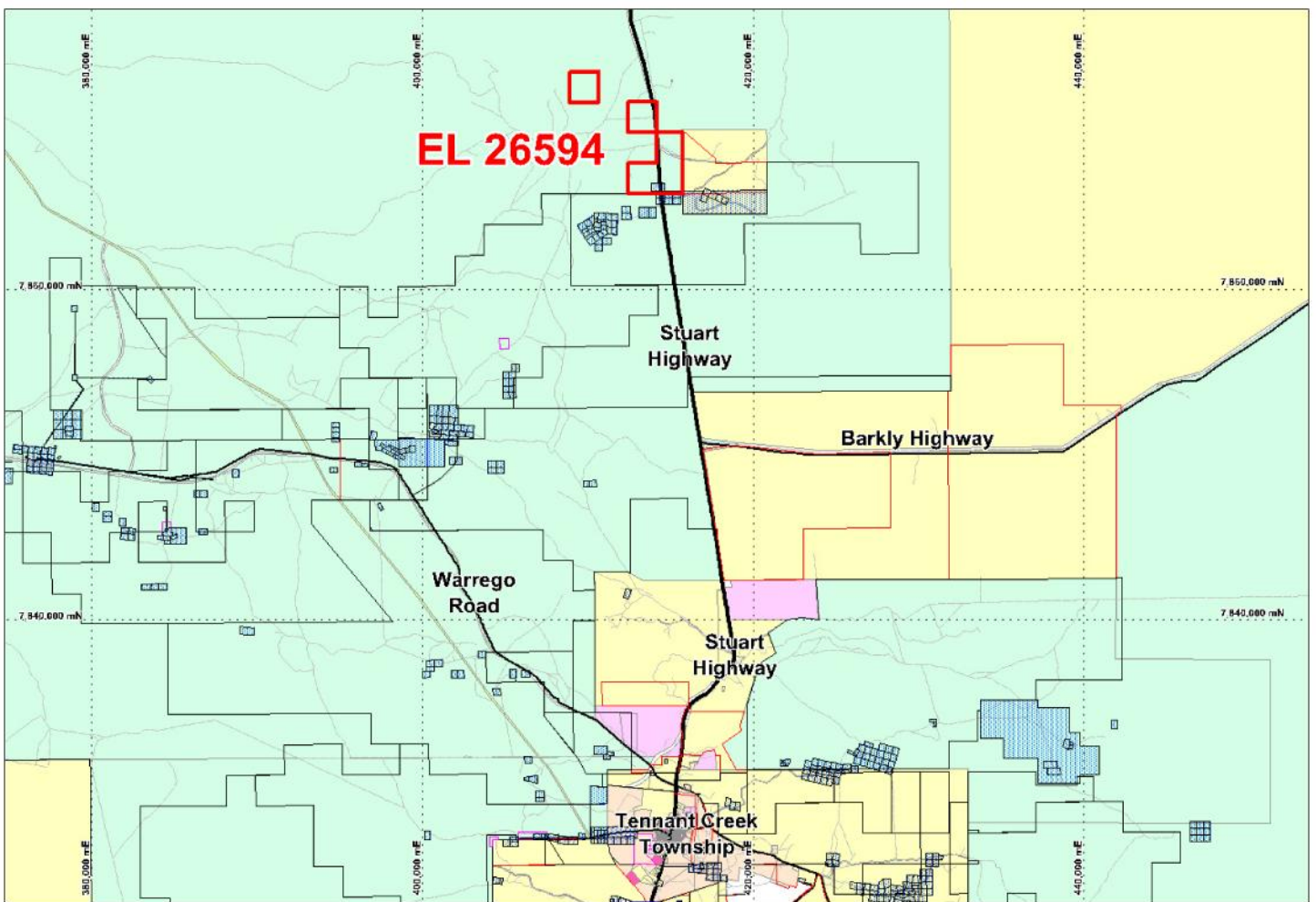


Figure 2: EL 26594

### 3.2 EL 26595 RUSSELL

EL 26595 RUSSELL is located between approximately 28km and 39km north east of Tennant Creek Township, on the Flynn (5759) and Short Range (5659) 1:100 000 scale map sheets.

The principal access to the southern and western areas of the licence area from Tennant Creek is north west via the Warrego road and then by the roads that lead to the historical Gecko and Orlando Mine workings, then from here via various dirt roads and tracks along fence lines. The principal access to the north and east areas of the license, from Tennant Creek, is north via the Stuart Highway which runs along the eastern boundary of the tenement, and then west and south west by various dirt roads and fence line tracks. However, much of the area is rocky, without tracks and difficult to reach, even in a 4WD vehicle. The unsealed tracks become impassable during the wet season.

Figure 3 shows location EL 26595 with respect to the Tennant Creek Township.

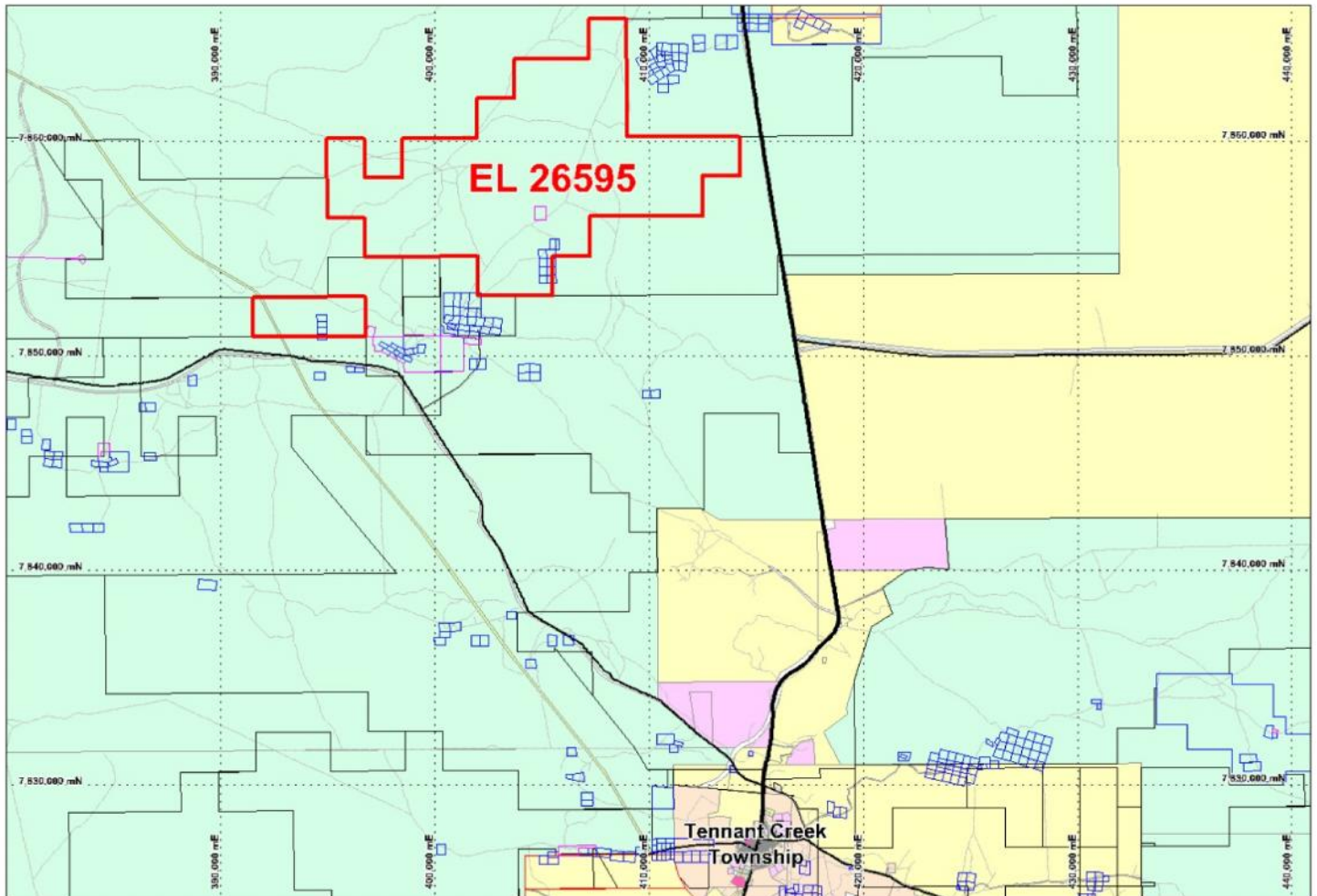


Figure 3: EL 26595



### 3.3 EL 28776 WHIPPET

EL 28776 WHIPPET is located between approximately 33km and 44km north north-east of the Tennant Creek Township, on the Flynn (5759) 1:100 000 scale map sheets.

The principal access to the general license area from Tennant Creek is north via the Stuart Highway and then east and west by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 4 shows location EL 28775 with respect to the Tennant Creek Township.

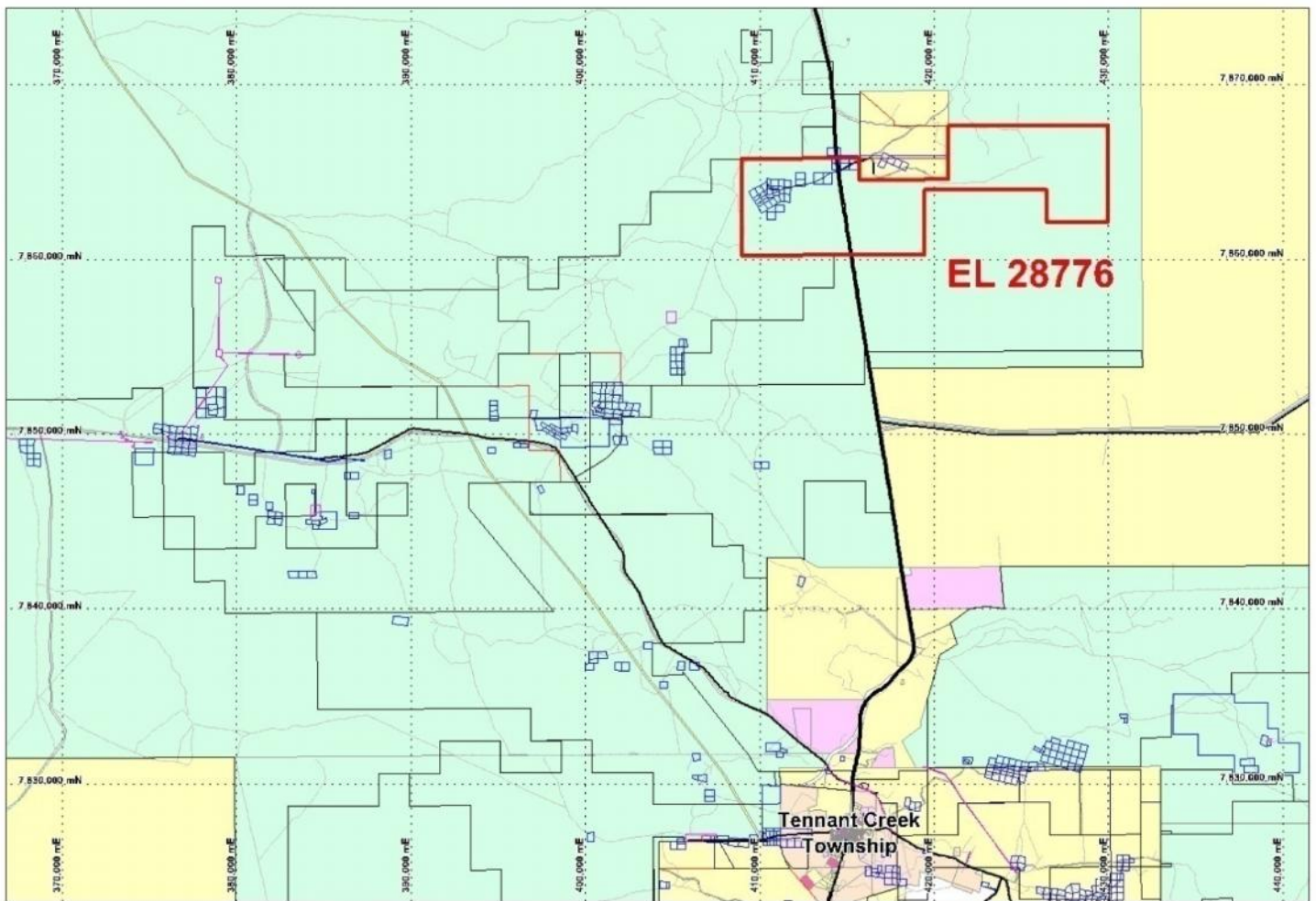


Figure 4: EL 28776

### 3.4 EL 28777 BISHOPS CREEK

EL 28777 BISHOPS CREEK is located between approximately 15km and 33km north of the Tennant Creek Township, on the Flynn (5759) and Tennant Creek (5758) 1:100 000 scale map sheets.

The principal access to the general license area from Tennant Creek is north via the Stuart Highway and then east and west by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 5 shows location EL 28777 with respect to the Tennant Creek Township.

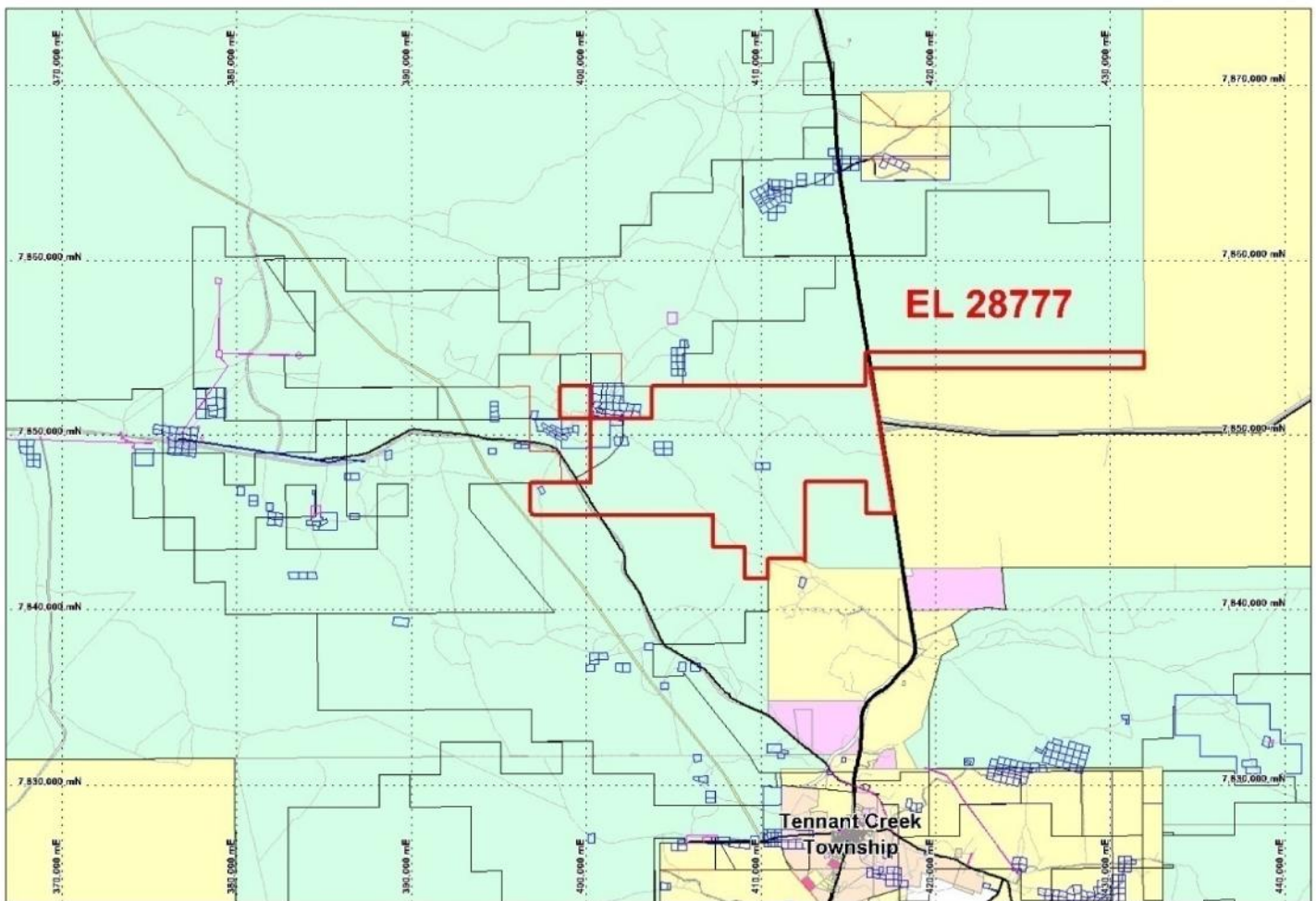


Figure 5: EL 28777

### 3.5 EL 28913 AMSTEL

EL 28913 AMSTEL is located between approximately 32km and 46km north east of the Tennant Creek Township, on the Flynn (5759) and Short Range (5659) 1:100 000 scale map sheets.

The principal access to the general license area from Tennant Creek is north west via the Warrego Road then north by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 6 shows location EL 28913 with respect to the Tennant Creek Township.

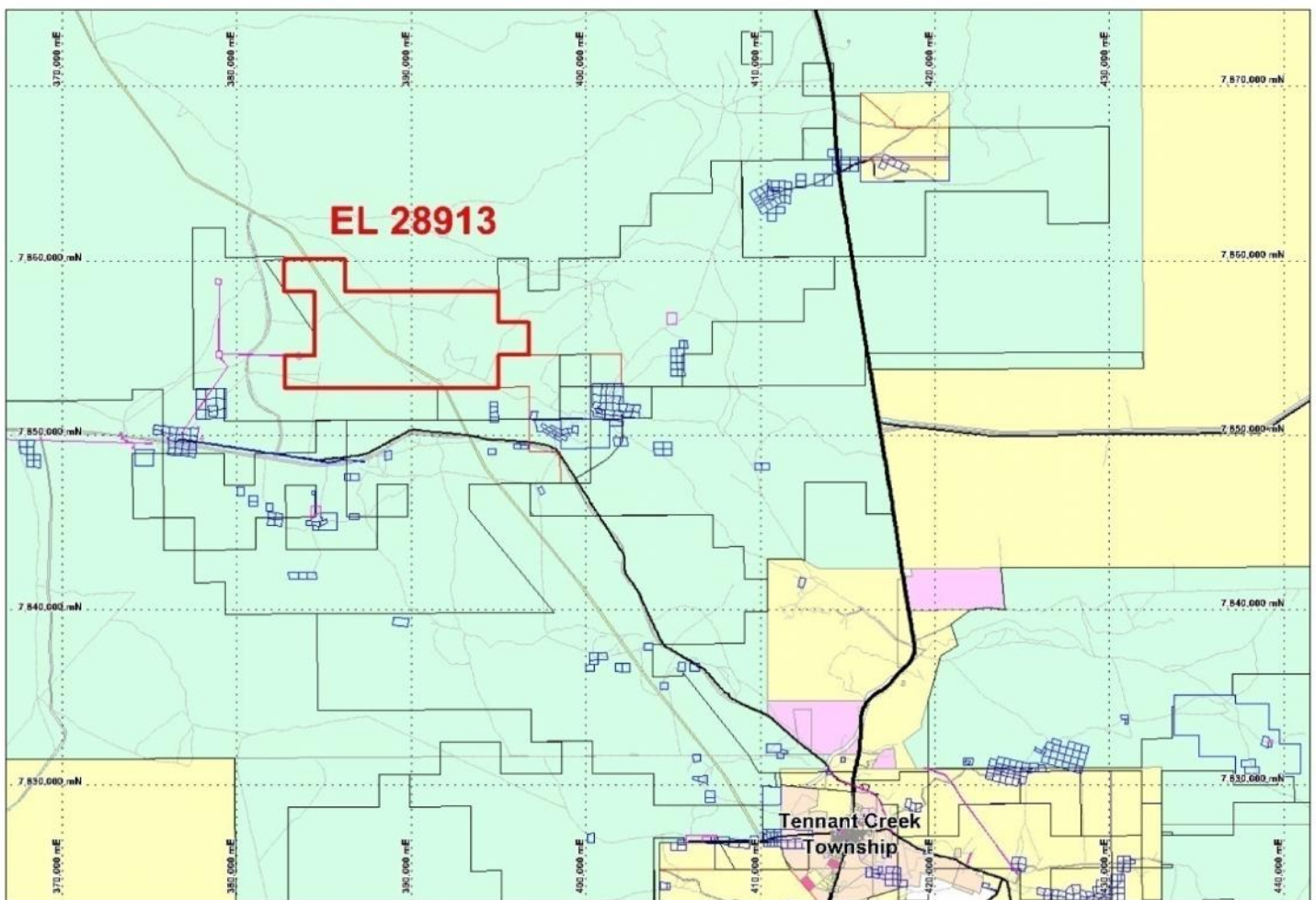


Figure 6: EL 28913

### 3.6 EL 29012 TETLEY

EL 29012 TETLEY is located between approximately 29km and 32km north east of the Tennant Creek Township, on the Flynn (5759) 1:100 000 scale map sheets.

The principal access to the general license area from Tennant Creek is north via the Warrego Road and then either north via the Orlando or Gecko Mine roads, from here it is further north by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 7 shows location EL 29012 with respect to the Tennant Creek Township.

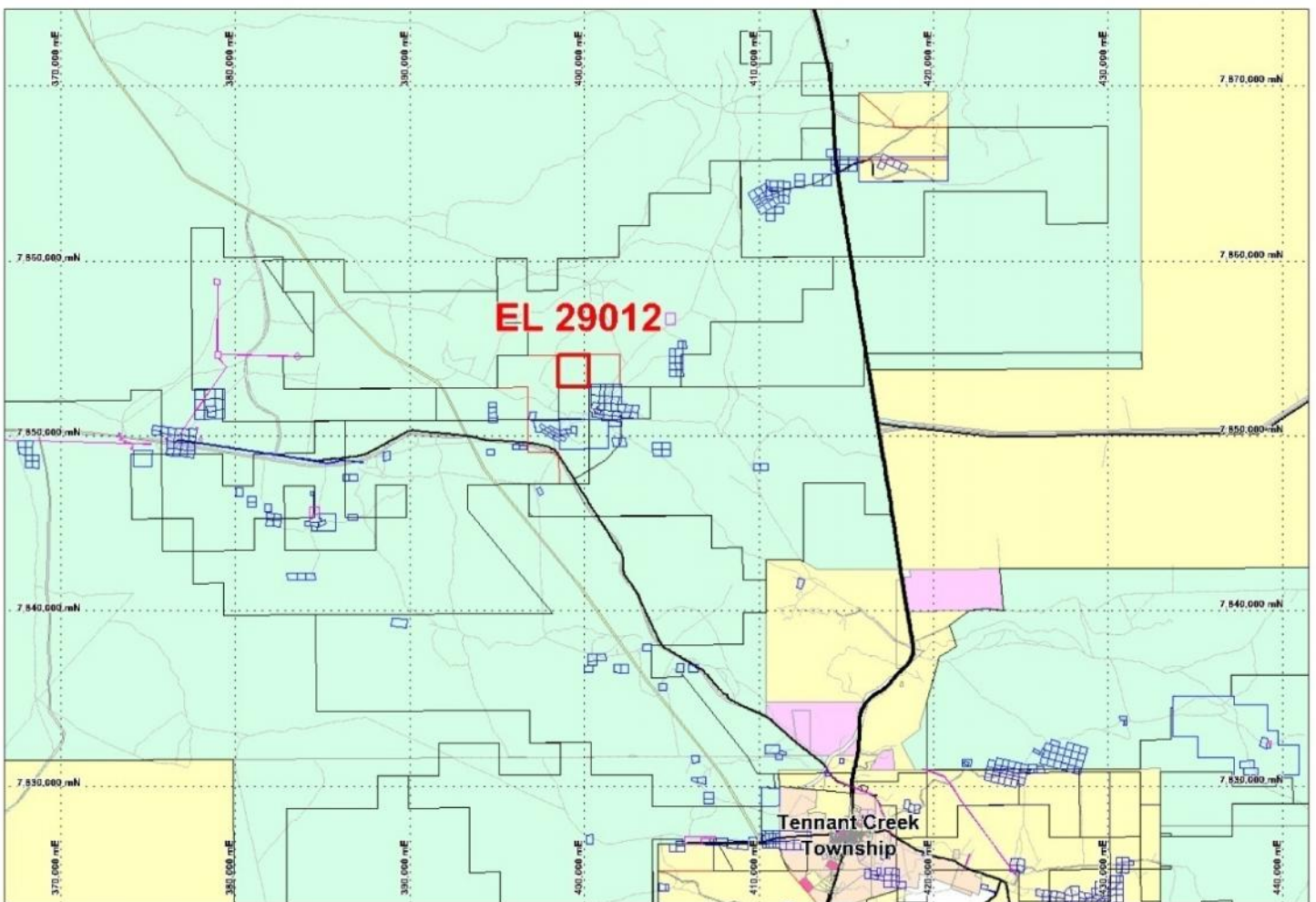


Figure 7: EL 29012

### 3.7 EL 29488 ROCKY

EL 29488 ROCKY is located between approximately 25km and 35km north east of the Tennant Creek Township, on the Flynn (5759) 1:100 000 scale map sheets.

The principal access to the general licence area from Tennant Creek is north via the Warrego Road which passes through the southernmost portion of the licence. Access to the other areas of the licence is either north via the Orlando or Gecko Mine roads, from here it is further north and west by various dirt roads and fence line tracks. However, much of the license areas are rocky, without tracks and difficult to reach, even in a 4x4 vehicle. The unsealed tracks become impassable during the wet season.

Figure 8 shows location EL 29488 with respect to the Tennant Creek Township.

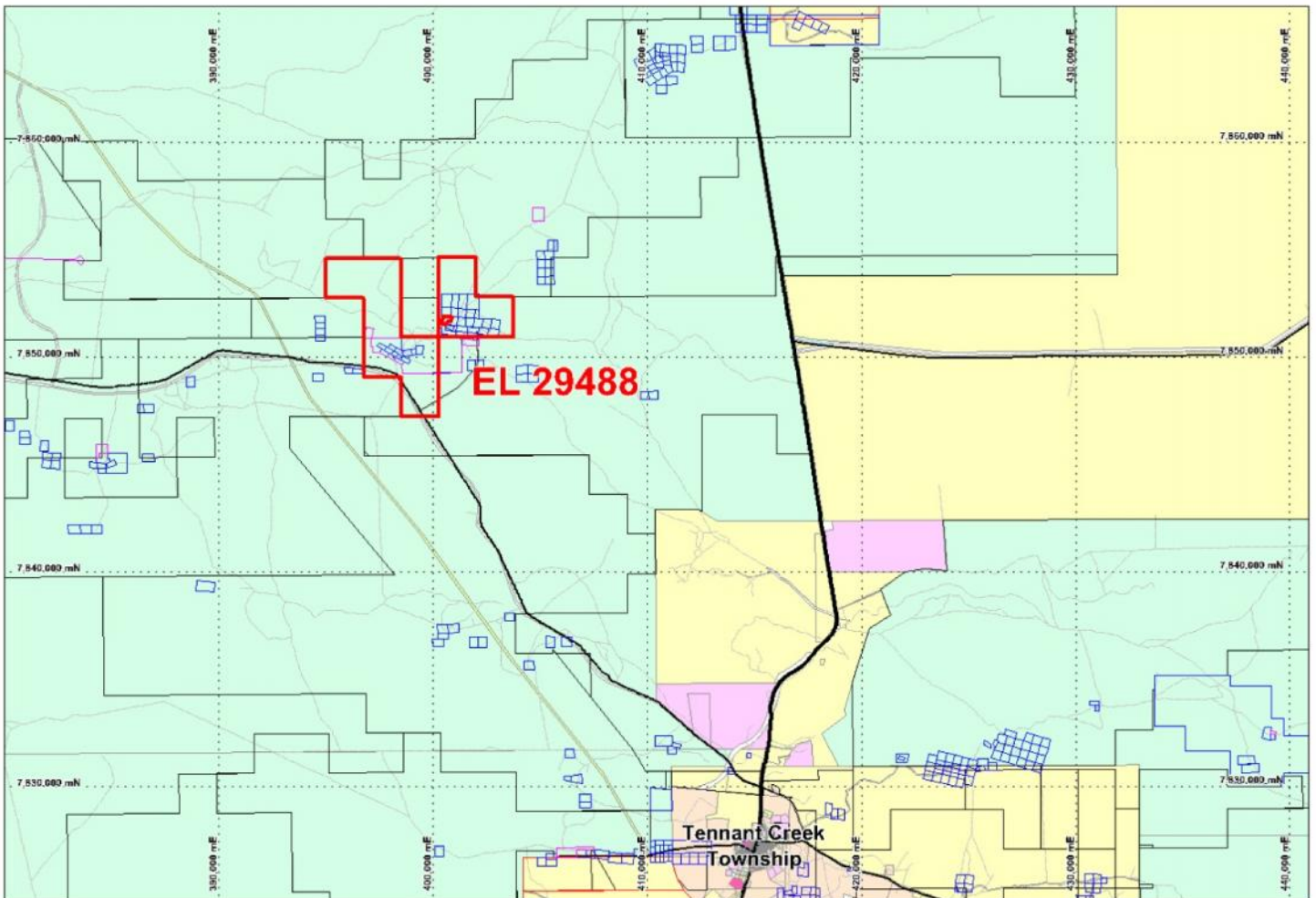


Figure 8: EL 29488

## 4. TENURE

Tenure details for the 7 Exploration Licences within the NPA are as follows, during the reporting period Emmerson was granted a further licences, as detailed further below:

Table 1: NPA Tenure details.

Exploration Licence	Licence Holder	Blocks & part-blocks	Area (km <sup>2</sup> )	Date of Grant/ <i>Renewal</i>	Period of Grant/ <i>Renewal</i>
SEL 26594 BILLS	GIANTS REEF EXPLORATION PTY LTD	5	15.36	06 July 2014	2
SEL 26595 RUSSELL	GIANTS REEF EXPLORATION PTY LTD	39	139.3	06 July 2014	2
EL 28776 WHIPPET	GIANTS REEF EXPLORATION PTY LTD	32	94.85	16 November 2011	6
EL 28777 BISHOPS CREEK	GIANTS REEF EXPLORATION PTY LTD	54	165.15	14 September 2011	4
EL 28913 AMSTEL	GIANTS REEF EXPLORATION PTY LTD	22	2.93	23 December 2011	6
EL 29012 TETLEY	GIANTS REEF EXPLORATION PTY LTD	1	3.23	05 April 2014	2
EL 29488 ROCKY	GIANTS REEF EXPLORATION PTY LTD	9	29.02	01 May 2013	6

Exploration Licences in the NPA lie within both NT Portion 408, Phillip Creek, Perpetual Pastoral Lease 946 and on Inalienable Aboriginal Freehold land held by the Warumungu Land Trust.

An Agreement needs to be further negotiated which would established land access for mineral exploration upon Warumungu Land Trust areas, including EL Application 27539, which will form part of this combined report following its grant. Currently the application is under Veto due to exit on 09December 2014.

All of the EL's in the NPA are on Perpetual Pastoral Lease and are subject to an Indigenous Land Use Agreement (ILUA), signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council, and Giants Reef.

### 4.1 EL 26594 BILLS

Exploration Licence 26594, formally SEL 26594 was granted to Giants Reef Exploration Pty Ltd on the 07 July 2008, for a period of 4 years, with further 2 year renewals granted in 2012 and 2014.

EL 26594 is a licence in substitute of historical EL's 22590, 10311 & 10129.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 26594 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

At the end of the first tenure year an Application for a Waiver of Reductions was submitted and granted for EL 26594. At the end of the second year a reduction of 5 blocks (50%) to retain a total of 5 Blocks was made for EL 26594.

#### **4.2 EL 26595 RUSSELL**

Exploration Licence 26595 was granted to Giants Reef Exploration Pty Ltd on the 07 July 2008, for a period of 4 years, with further 2 year renewals granted in 2012 and 2014.

EL 26595 is a licence in substitute of EL's 22583, 10017, 23073, 23745, 23746 & 9909.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 26595 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

At the end of the first, second and third tenure years Applications for Waivers of Reductions were submitted and granted for EL 26595.

#### **4.3 EL 28776 WHIPPET**

Exploration Licence 28776 was granted to Giants Reef Exploration Pty Ltd on the 16 November 2011, for a period of 6 years.

EL 28776 was an amalgamation of EL's 10077, 10101, 22165 & 22589.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 28776 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

#### **4.4 EL 28777 BISHOPS CREEK**

Exploration Licence 28777 was granted to Giants Reef Exploration Pty Ltd on the 14 September 2011, for a period of 4 years.

EL 28777 was an amalgamation of EL's 10016, 23183, 27131 & 9939.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 28777 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

#### **4.5 EL 28913 AMSTEL**

Exploration Licence 28913 was granted to Giants Reef Exploration Pty Ltd on the 23 December 2011, for a period of 6 years.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 28777 is subject to an Indigenous Land Use Agreement (ILUA)

signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

#### **4.6 EL 29012 TETLEY**

Exploration Licence 29012 was granted to Giants Reef Exploration Pty Ltd on the 05 April 2012, for a period of 2 years with a further 2 year renewal granted in 2014.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 29012 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

#### **4.7 EL 29488 ROCKY**

Exploration Licence 29488 was granted to Giants Reef Exploration Pty Ltd on the 01 May 2013, for a period of 6 years.

The EL lies within NT Portion 408, Perpetual Pastoral Lease 946, Phillip Creek Station. Exploration Licence 29012 is subject to an Indigenous Land Use Agreement (ILUA) signed in September 2000 between the Native Title holders of the Tennant Creek region, represented by the Central Land Council (CLC), and Giants Reef.

## **5. GEOLOGY**

### **5.1 Regional Geology**

The reader is referred to AusIMM Monograph 14 (Geology of the Mineral Deposits of Australia and Papua New Guinea), Volume 1, pp. 829-861, to gain a good introduction to the regional geology and styles of gold-copper mineralisation of the area.

In 1995 the Northern Territory Geological Survey released a geological map and explanatory notes for the Flynn and Short Range 1:100,000 sheets, which covers the area of the Licences.

The rocks of the Warramunga Formation host most of the orebodies in the region and underlie most of the Exploration Licences.

### **5.2 Geology of the Northern Project Area**

The NPA covers a region of the Tennant Creek Province and includes deformed lower-greenschist facies flysch sequence (Warramunga Formation) intruded by syn-orogenic granite and granodiorite as well as stratabound felsic porphyry. This sequence is overlain by silicic volcanics and volcanoclastics (Flynn Subgroup) and intruded by late orogenic granite, porphyry and lamprophyre. The Warramunga Formation comprises greywacke, siltstone, shale with interbedded felsic volcanics. Crustal melting resulted in the formation of dry, I-type granodiorite melts and granitic differentiates (Tennant Creek Supersuite), which intruded the Warramunga Formation and lower parts of the Flynn Subgroup during and subsequent to the Barramundi Orogeny. Deformation of the Warramunga Formation produced tight upright folds with a pervasive sub-vertical east west slaty cleavage accompanied by lower greenschist facies metamorphism. Deposition of the volcanosedimentary Flynn Subgroup more or less coincided with the plutonic events.



Progressive dextral shearing resulted in large-scale east trending open folds, as defined by the stratabound porphyries. Disharmonic folds, angular folds and plunging doubly peaking anticlines with a weak sub-vertical crenulation cleavage developed within the Warramunga Formation. North west trending open folds of disharmonic style were generated within the Flynn Subgroup.

The youngest igneous events in the Tennant Creek Province were intrusion of the Warrego and Gosse River East granites, as well as lamprophyre dykes and sills.

The NPA is largely covered by Quaternary sands and gravels in relict fluvial systems, active channels, floodplains and quartz-rich dissected colluvial fan deposits.

Outcrop within the NPA is limited to ridges and these comprise scattered outcrops of Palaeoproterozoic Warramunga Formation and Flynn Sub-group/ Tomkinson Creek Sub-group (Ooradidgee Group).

### **5.3 EL 26594 BILLS**

The exposed geology in central portion of EL 26594 consists of several extensive outcrops of weathered siltstone and greywacke of the Palaeoproterozoic Warramunga Formation. Much of the Licence is covered by Cainozoic sediments and includes soils and alluvial outwash deposits. Airborne and ground magnetic data and field mapping suggest that metasediments of the Palaeoproterozoic Warramunga Formation underlie the Licence area.

The northern most region of EL 26594 includes outcrops, which coincide with ridges and isolated hills, these ridges and isolated hills consist of scattered outcrops of weathered siltstone and greywacke of the Paleoproterozoic Warramunga Formation, which most likely underlies Cainozoic colluvium scree, alluvial red soil plains and less extensive alluvial deposits in active channels and on flood plains.

The southern portion of the licence area is largely covered by the Tennant Creek drainage system and comprises Cainozoic alluvium and colluvium. The cover sediments include alluvial deposits in active channels and on floodplains, and sheet /dune sand and sandy soil on high floodplain terraces.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) 1:100 000 sheet, which covers the area of the license.

### **5.4 EL 26595 RUSSELL**

More than 98% of EL south western portion of the licence comprises units of the Ooradidgee Group and these are dominated by the Wundirgi Formation which is comprised of arenite, siltstone, shale, tuff, chert and silicified tuff. Other units of the Ooradidgee Group include ignimbrites, lapilli tuff and rhyolitic lava. These units are intruded by monzonite and quartz-monzonites of the Treasure Suite. Gold mineralisation is hosted by these felsic intrusives at two small prospects some 5.5 kms to the west and include the Last Hope (415 oz) and Bull Pup (55 oz) mines.

Minor sedimentary and volcanic units of the younger Hatches Creek Group occur at the northern edge of the south west portion. Less than 2% of Warramunga Formation occurs in the south west portion, however this comprises sandstone dominated volcano lithic,

turbiditic sequences as opposed to the more prospective highly magnetic siltstone dominated Warramunga Formation units.

Outcrops, which coincide with ridges and isolated hills, are dominate throughout the central portion of the licence area, these ridges and isolated hills consist of weathered siltstone and greywacke of the Paleoproterozoic Warramunga Formation and most likely underlie Cainozoic colluvium scree, alluvial red soil plains, quartz rich dissected colluvial fan deposits and less extensive alluvial deposits in active channels and on flood plains. The Quartz Hill Fault system dominates the structure of the central portion of the licence, and is the major control on mineralisation and ironstone emplacement.

The majority of the south central portion of the licence area is underlain by turbidite sediments of the Palaeoproterozoic Warramunga Formation (1865-1855 Ma), predominately greywacke and siltstones. This formation is host to virtually all the magnetite-haematite (ironstone-hosted) gold-copper-bismuth mineralisation and ore bodies in the Tennant Creek goldfield.

The northern portion of the licence area is on the northern fringe of the established Tennant Creek goldfield. Except in a few localities, bedrock geology within the Licence area is not well revealed due to the discontinuous nature of sparse outcrops. Much of the northern Licence area is underlain by the predominantly felsic volcanics or volcanically derived sedimentary rocks of the Flynn Sub-group, while the more northern parts consist of sediments of the lower Tomkinson Creek Sub-group.

There are a number of intermittent outcrops of granite, metamorphosed sediments and ironstone throughout the eastern portion of the licence area.

The geology in central east consists of major outcrops of weathered siltstone and greywacke of the Paleoproterozoic Warramunga Formation forming a series of ridges trending north west. The western region contains quartz rich dissected colluvial fan deposits with less extensive covering by Cainozoic colluvium, scree and alluvial deposits in active channels and on flood plains. The portion of the licence is dominated by Cainozoic colluvium, scree and alluvial deposits in active channels and on flood plains with less extensive quartz rich dissected colluvial fan deposits.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) 1:100 000 sheet, which covers the area of the license.

## **5.5 EL 28776 WHIPPET**

The geology of Exploration Licence 28776 includes outcropping Warramunga Formation, comprising fine to medium grained lithic arenite, volcanic arenite (metagreywacke), siltstone, shale, slate and ferruginous mudstone. Ooradidgee Group units comprising conglomerate, sandstone, felsic crystal-lithic tuff and lapilli tuff also outcrop within the Licence. Much of the central region of the tenement is covered by Quaternary alluvial deposits and includes sandy soil and sheet and dune sand. The eastern region dominant lithologies are Warramunga Formation siltstone, shale and greywacke with minor quartz porphyry in the south, numerous quartz and quartz-haematite ironstones are present in the ridges. Several east striking shears traverse the area.

The western geology is dominated by Cainozoic colluvium scree, alluvial red soil plains and less extensive quartz rich dissected colluvial fan deposits, alluvial deposits in active channels and on flood plains and also a region of clay soil in a poorly drained depression. Minor outcrops, which coincide with isolated hills are present in the eastern areas, the isolated hills consist of scattered outcrops of weathered siltstone and greywacke of the Palaeoproterozoic Warramunga Formation, which most likely underlies the dominant Cainozoic sediments.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) 1:100 000 sheet, which covers the area of the license.

### **5.6 EL 28777 BISHOPS CREEK**

The majority of the licence area is underlain by turbidite sediments of the Palaeoproterozoic Warramunga Formation (1865-1855 Ma), predominately greywacke and siltstones. This formation is host to virtually all the magnetite-haematite (ironstone-hosted) gold-copper-bismuth mineralisation and ore bodies in the Tennant Creek goldfield. Exposure of the Proterozoic bedrock is fair to poor.

The Warramunga Formation in the western half of the licence is characterised by outcropping ridges which comprise scattered outcrops of weathered siltstone and greywacke with felsic volcanics or volcanically derived sedimentary rocks of the Flynn Sub-group/ Tomkinson Creek Sub-group (Ooradidgee Group), quartz-rich dissected colluvial fan deposits with minor, colluvium scree, felsic porphyry and alluvial deposits in active channels and on floodplains. The geology of the eastern half is characterised by large areas of Quaternary cover, including colluvium, scree, sheet and dune sand and sandy soil and alluvial deposits in active channels and on floodplains.

Known mineralisation in the Licence is generally located along NW trending structures, most notable of these being the "Quartz Hill Fault". These structures also correlate well with the many mapped outcropping Ironstones, which represent potential hosts for ironstone related Au-Cu-Bi mineral deposits.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) and Tennant Creek (5758) 1:100 000 sheets, which covers the area of the license.

### **5.7 EL 28913 AMSTEL**

The south eastern portion of the licence area is underlain by turbidite sediments of the Palaeoproterozoic Warramunga Formation (1865-1855 Ma), predominately greywacke and siltstones. This formation is host to virtually all the magnetite-haematite (ironstone-hosted) gold-copper-bismuth mineralisation and ore bodies in the Tennant Creek goldfield.

The remainder of the licence is characterised by large areas of Quaternary cover, including colluvium, scree, sheet and dune sand and sandy soil and alluvial deposits in active channels and on floodplains.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Short Range (5659) and Flynn (5759) 1:100 000 sheets, which covers the area of the license.

## **5.8 EL 29012 TETLEY**

The licence area is underlain by turbidite sediments of the Palaeoproterozoic Warramunga Formation (1865-1855 Ma), predominately greywacke and siltstones. This formation is host to virtually all the magnetite-haematite (ironstone-hosted) gold-copper-bismuth mineralisation and ore bodies in the Tennant Creek goldfield.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) 1:100 000 sheet, which covers the area of the license.

## **5.9 EL 29488 ROCKY**

The licence area is underlain by turbidite sediments of the Palaeoproterozoic Warramunga Formation (1865-1855 Ma), predominately greywacke and siltstones. This formation is host to virtually all the magnetite-haematite (ironstone-hosted) gold-copper-bismuth mineralisation and ore bodies in the Tennant Creek goldfield.

The Warramunga Formation is characterised in a number of places by outcropping ridges which comprise scattered outcrops of weathered siltstone and greywacke with felsic volcanics or volcanically derived sedimentary rocks of the Flynn Sub-group/ Tomkinson Creek Sub-group (Ooradidgee Group), quartz-rich dissected colluvial fan deposits with minor, colluvium scree, felsic porphyry and alluvial deposits in active channels and on floodplains.

In 1995 the Northern Territory Geological Survey released geological maps and explanatory notes for the Tennant Creek 1:250,000 sheet, and the Flynn (5759) 1:100 000 sheet, which covers the area of the license.

# **6. PREVIOUS EXPLORATION**

## **Targets and Concepts**

Exploration within the NPA has historically been aimed at discovering Tennant Creek style iron oxide copper-gold (IOCG) deposits within the Warramunga Formation.

This type of deposit is well documented. Better known examples of the primary copper-gold type in the region include Gecko and Orlando. These deposits are all hosted in ironstone (magnetite +/- haematite) masses with associated chloritic, dolomitic and silicic alteration within larger shear systems. Examples of both the primary and oxide gold types is the Orlando deposit.

There are numerous ironstone outcrops and magnetic anomalies that represent non-outcropping ironstone masses, scattered throughout most of the NPA.

The discovery of the haematite-magnetite Chariot deposit in 1998 has shown the potential for variations on the classic magnetite ironstone hosted gold +/- copper deposits, where lower order magnetic anomalies, plus gravity methods can define new targets. Discoveries by Giants Reef of mineralisation such as at Malbec West, Marathon and Billy Boy further support this. Emmerson considers the potential for the discovery of mineralisation in hematite dominant ironstones in this group of titles is excellent.

As detailed below a new style of mineralisation has been discovered within the NPA, with implications for the entire Tennant Creek Mineral Field. The shear hosted, non magnetic mineralisation defined by intersected high grade gold and high grade copper has opened up the potential for economic discoveries in areas previously explored (for magnetic ironstones) and areas previously thought to be non prospective, mainly due to lack of magnetic anomalies.

A large area of the NPA is explored under a statutory exploration Mining Management Plan (MMP) termed Northern Project Area – Authorisation 0467-03.

Due to the increasing size of the previous/historical exploration, the details have been omitted from this report. For detailed historical exploration over the NPA, please refer to the 2012 report, as follows;

Walters, A 2012, *Combined Northern Project Area Report 2012*, Emmerson Resources Ltd.'

## **7. WORK DONE DURING THE REPORT PERIOD**

Exploration Licences in the Northern Project Area were explored by Emmerson, for Tennant Creek style iron oxide copper-gold deposits (IOCG deposits) and the recently discovered shear hosted non magnetic deposits.

The following sections records the exploration work completed on these EL's during the NPA Combined Reporting period from 16 August 2014 to the 15 August 2015.

### **General**

During the reporting period exploration activities were very limited due to corporate reasons, which entailed the seeking of a Joint Venture (JV) Partner or further funds to continue exploration in the Tennant Creek area and more specifically the NPA. Emmerson succeeded in securing Evolution as a Joint Venture Partner who has committed to spend \$25M over the next 5 years.

Following the formation of this JV, Emmerson commenced exploration activities centred around the re-evaluation of the potential for gold deep under the historical Gecko Mine. Although the hole was drilled in ML23969 it has implications for a more regional picture that extends from this ML into EL's of the NPA and will be described below.

Emmerson completed a seismic survey over the Historical Gecko Mine, more specifically the K44 ore body aimed at trying to resolve and deep targets previously not seen by other depth limited geophysical techniques and now past deep drilling.

The seismic section was interpreted by Emmerson and our JV partners geoscientists and a target was generated, figure 9 displays the plan view of the drilled hole (GODD032) and also a further proposed hole that has not been drilled to date, figure 10 displays the seismic section and the significant intercepts.

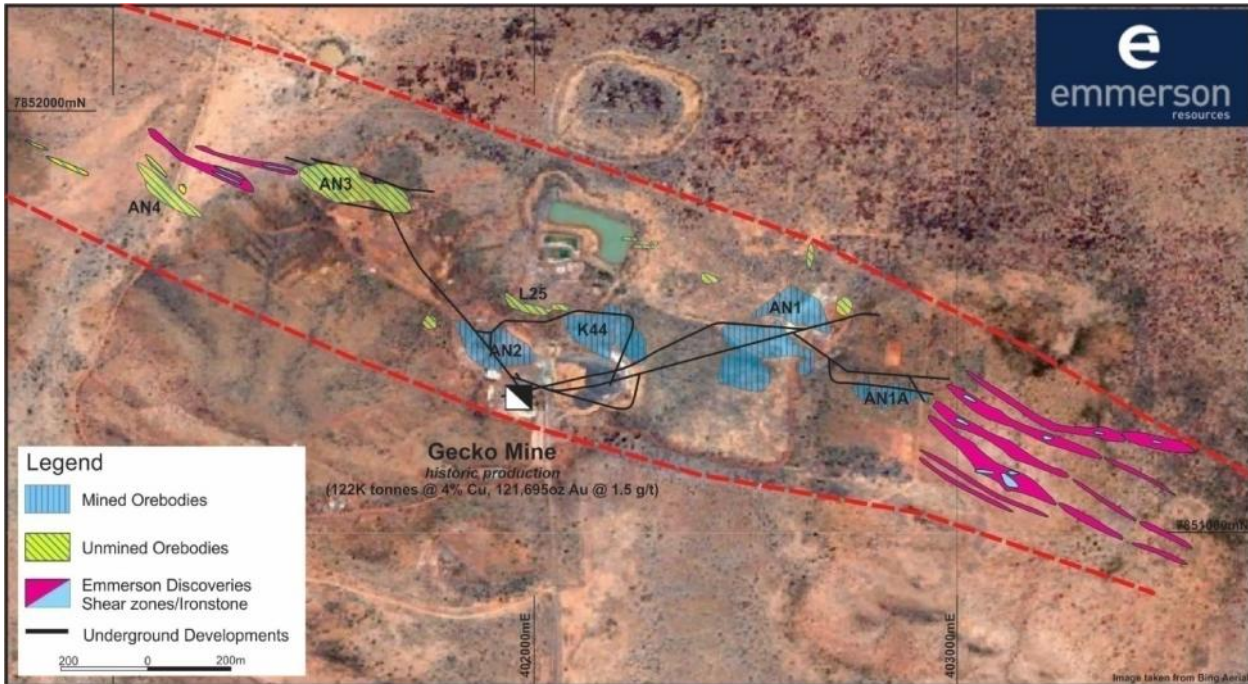


Figure 9: Plan view of GODD032

Emmerson drilled 1 deep diamond (DDH) hole, with an RC precollar under the historical Gecko mine (ML 23969) totalling 1,279m (of which 265m was an RC precollar and 1,014m was DDH).

Results from the drilling was mixed with high grade copper intersected in the RC precollar, with best results as below;

- o 7m at 5.98% Cu from 123m including 3m at 10.4% Cu
- o 3m at 4.75% Cu from 162m including 1m at 10.6% Cu
- o 1m at 2.37% Cu from 221m

The deeper results were disappointing but some remain outstanding.

The copper intersected in the top part of the hole potentially could be a western strike extension of Emmerson’s Goanna discovery located 800m to the east. A proposal for a drill program to confirm this extension will be prepared and tabled at the next JV meeting in late October 2015, for drilling in late 2015 or early 2016.

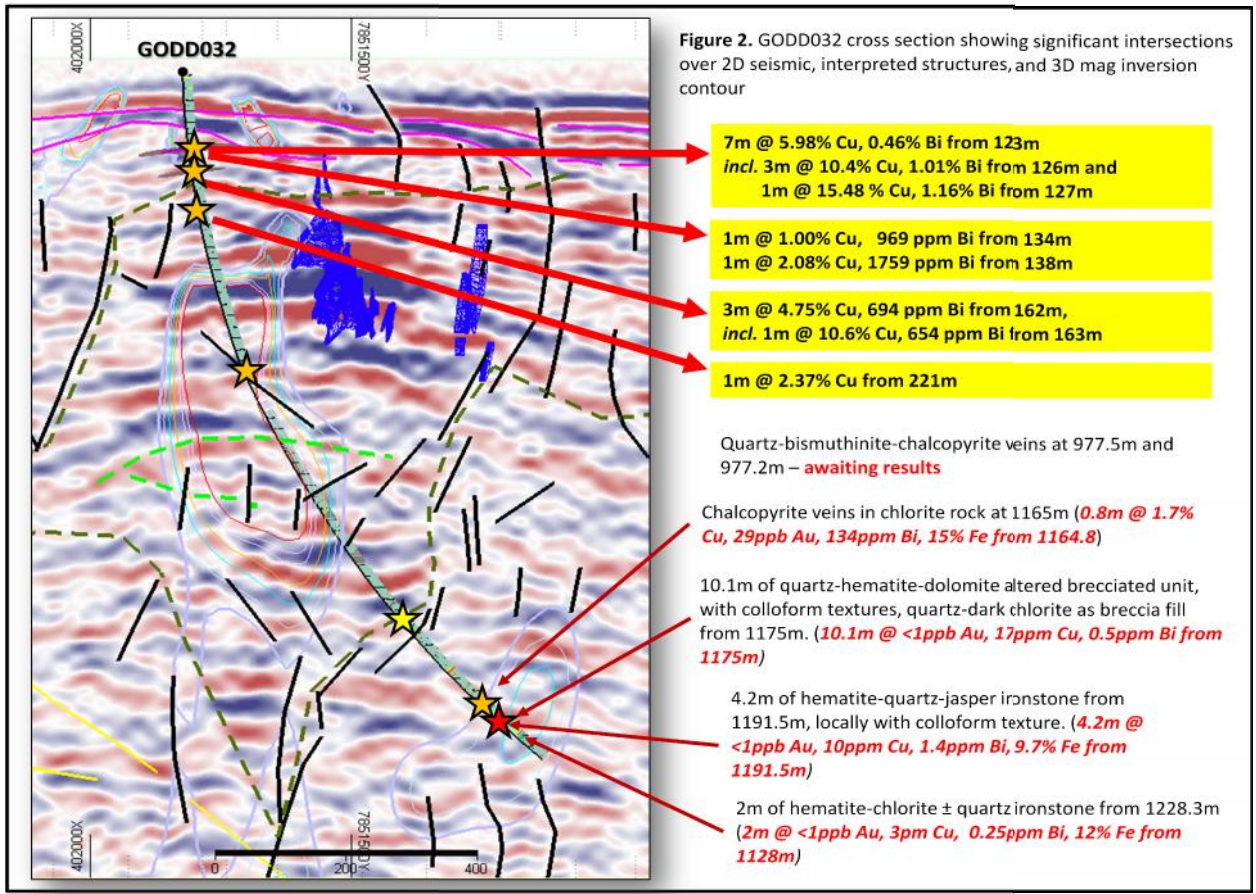


Figure 10: Cross Section of Seismic section and GODD032 significant intercepts

Emmerson also engaged Kenex Pty Ltd (Kenex) to construct a predictive model for the Tennant Creek Mineral Field and included all titles in the NPA. This product was completed and delivered to Emmerson in April 2015, preliminary results have been generated for field validation and will then feed back into the model to assist in generating the most robust targets, therefore the final results of this project and its end product will be reported in the next annual report of the NPA, the areas of interest in the NPA has been noted in the relevant section.

Work was also completed on Matt Hill’s PhD project, run by the Centre for Exploration Targeting (CET) out of the University of Western Australia (UWA), titled the ‘Tennant Creek Project’, the project is to build a 3D structural model of the entire Tennant Creek Mineral Field. Work conducted under this project involved field mapping, and software modelling of the observed and captured structural data, the completed data is yet to be presented.

**7.1 EL 26594 BILLS**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified

during the Kenex Project. The areas in the title that were identified were the Marathon – Troy-Macedon-Thrace-Edna Beryl Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

EL 26594 hosts the significant geological structure associated with a gravity ridge running through the southern portion of the title. This trend encapsulates the North Star to Edna Beryl trend.

## **7.2 EL 26595 RUSSELL**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Queen of Sheba-Voltan-Evening Star Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

Emmerson contracted seismic survey company, HiSeis to conduct a seismic survey over the historical Gecko Mine as described above, part of this survey was conducted in the title area, although the targets generated were not.

The exploration work be carried out over recent years in EL's 29488 and 28777 at the Gecko and Orlando areas will eventually be extrapolated into EL 26595 which share a common boundary (EL 26595's southern boundary), the identified shear zones hosting the high grade gold and copper may extend north east into EL 26595, but this has yet to be examined and determined.

EL 26595 hosts a number of significant geological structures the Quartz Hill fault runs through the south west portion of the EL and the Gecko to Marathon trend, runs through the bulk of the EL, identified as the blues lines bend in an arc from gecko in the south to towards North Star in the north east. Both these major structures host significant historical mines and the sections of the structures that lie within EL 26595 are considered to be prospective and show both prominent and subdued VRMI anomalism, as can be seen in figure 11. HeliTEM covers the south western portion and forms part of the Orlando and Gecko block.

All future work will be a direct result of the extrapolation of work in the Gecko Corridor and Orlando Shears out into further brownfields and eventual green fields including the vast majority of EL 26595.



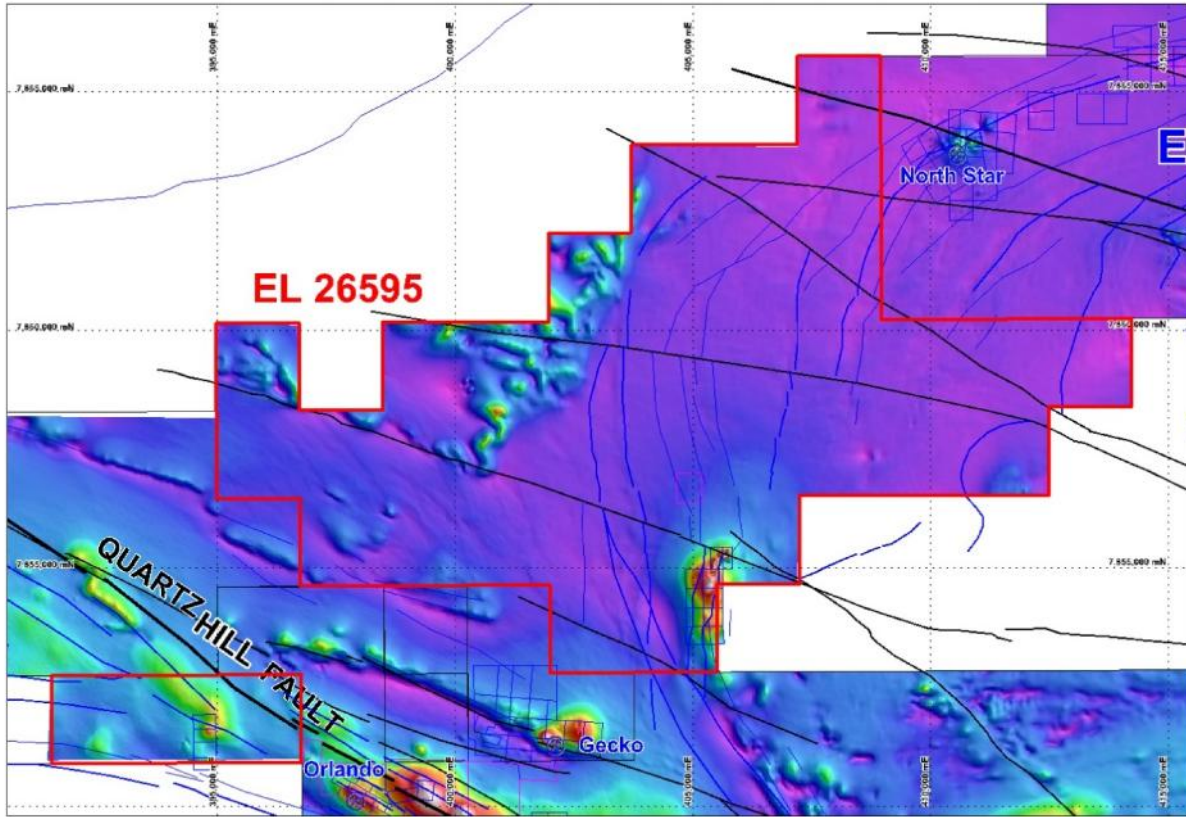


Figure 11: EL 26595 vs. Structure and VRMI.

### 7.3 EL 28776 WHIPPET

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the North Star-Hermitage-Rising Star Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

### 7.4 EL 28777 BISHOPS CREEK

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Horner-Mt Argo Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

Emmerson contracted seismic survey company, HiSeis to conduct a seismic survey over the historical Gecko Mine as described above, part of this survey was conducted in the title area, although the targets generated were not.

## 7.5 EL 28913 AMSTEL

Exploration in EL 28913 was limited as described above.

EL 28913 title is cut by the significantly prospective Quartz Hill Fault Zone defined by various areas of prominent VRMI anomalism, as can be seen in figure 12, below. The HeliTEM over the Gecko and Orlando Areas doesn't extend far enough to the north west to cover EL 28913, but should the Gecko Corridor continue then the title would become a high priority area for the next round of HeliTEM surveys.

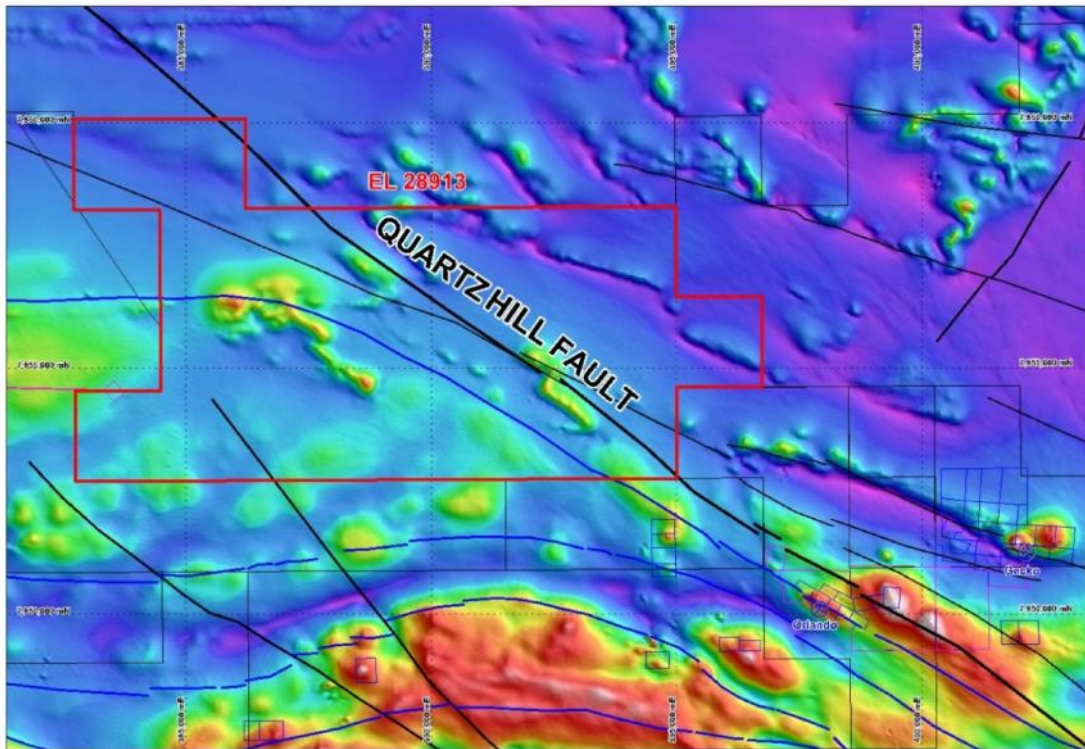


Figure 12: EL 28913 vs. VRMI, structure & historical workings.

## 7.6 EL 29012 TETLEY

Exploration activity was limited as described above. Emmerson is preparing a proposal to drill a program aimed at extending the goanna mineralisation westward across the southern side of the Historical Gecko Mine, should this proposal go ahead and have positive results then further extensions will be examined including extensions into the title area.

Emmerson is continuing to engage with the Traditional Owners and the CLC to try to re-examine the exclusion zone boundary to allow access to areas to conduct exploration activities. This will be ongoing throughout 2016 and will determine the level of future exploration potential for the EL.

## **7.7 EL 29488 ROCKY**

Exploration activity was limited as described above. Emmerson is preparing a proposal to drill a program aimed at extending the goanna mineralisation westward across the southern side of the Historical Gecko Mine, should this proposal go ahead and have positive results then further extensions will be examined including extensions into other areas of the title.

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Monitor-Gecko-Goanna Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

## **8. REHABILITATION**

No rehabilitation was required during the reporting. All future rehabilitation will be conducted as detailed in the NPA Mining Management Plan (MMP) – Authorisation 0467-03.

## **9. CONCLUSIONS**

### **9.1 EL 26594 BILLS**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Marathon – Troy-Macedon-Thrace-Edna Beryl Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

### **9.2 EL 26595 RUSSELL**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Queen of Sheba-Voltan-Evening Star Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

The exploration work be carried out over recent years in EL's 29488 and 28777 at the Gecko and Orlando areas will eventually be extrapolated into EL 26595 which share a common boundary (EL 26595's southern boundary), the identified shear zones hosting the high grade gold and copper may extend north east into EL 26595, but this has yet to be examined and determined.

All future work will be a direct result of the extrapolation of work in the Gecko Corridor and Orlando Shears out into further brownfields and eventual green fields including the vast majority of EL 26595.

### **9.3 EL 28776 WHIPPET**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the North Star-Hermitage-Rising Star Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

### **9.4 EL 28777 BISHOPS CREEK**

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Horner-Mt Argo Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

### **9.5 EL 28913 AMSTEL**

Exploration in EL 28913 was limited as described above.

EL 28913 title is cut by the significantly prospective Quartz Hill Fault Zone defined by various areas of prominent VRMI anomalism, as can be seen in figure 12, below. The HeliTEM over the Gecko and Orlando Areas doesn't extend far enough to the north west to cover EL 28913, but should the Gecko Corridor continue then the title would become a high priority area for the next round of HeliTEM surveys.

### **9.6 EL 29012 TETLEY**

Exploration activity was limited as described above. Emmerson is preparing a proposal to drill a program aimed at extending the goanna mineralisation westward across the southern side of the Historical Gecko Mine, should this proposal go ahead and have positive results then further extensions will be examined including extensions into the title area.

Emmerson is continuing to engage with the Traditional Owners and the CLC to try to re-examine the exclusion zone boundary to allow access to areas to conduct exploration activities. This will be ongoing throughout 2016 and will determine the level of future exploration potential for the EL.

### **9.7 EL 29488 ROCKY**

Exploration activity was limited as described above. Emmerson is preparing a proposal to drill a program aimed at extending the goanna mineralisation westward across the southern side of the Historical Gecko Mine, should this proposal go ahead and have positive results then further extensions will be examined including extensions into other areas of the title.

Exploration was limited as detailed in the general section above. Work that was conducted included preparations for the detailed review of prospective areas identified during the Kenex Project. The areas in the title that were identified were the Monitor-Gecko-Goanna Corridor. Work on evaluating this prospective area in terms of Kenex generated targeting will be assessed during 2016.

## **10. REFERENCES**

Walters, A 2012, *Combined Northern Project Area Report 2012*, Emmerson Resources Ltd.'

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**EMMERSON RESOURCES LTD**

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REPORT NAME: COMBINED ANNUAL REPORT FOR THE NORTHERN PROJECT AREA 16 AUGUST 2013 – 15 AUGUST 2014

PROSPECT NAMES(s): GECKO ROAD, STONEY DAM, WHIPPET EAST, SETTLEMENT, BINARY, ALEXANDER, WHIPPET NORTH, GIBSON CREEK, COPERNICUS, MONZONITE, MORNING STAR, WHIPPET HILL, STUART HIGHWAY, PUMPING STATION, JUNCTION, VIVID, MARKER, HAYWARD CREEK, LASSO, STAR WARS, BATTERY BLOCK, BILLS, RUSSELL, HANKINSON, PATAGONIA, ROCKY

GROUP PROSPECT NAME:

TENEMENT NUMBERS(s): EL 26594, EL 26595, EL 28776, EL 28777, EL 28913, EL 29012, EL29488

ANNIVERSARY DATE: 15 AUGUST

OWNER/JV PARTNERS: EMMERSON RESOURCES LTD, GIANTS REEF EXPLORATION PTY LTD, SANTEXCO PTY LTD, TC8 PTY LTD

AUTHOR(s): A. WALTERS

COMMODITIES: GOLD, COPPER

MAPS 1:250 000: TENNANT CREEK SE53-14

MAPS 1:100 000: FLYNN 5759, SHORT RANGE 5659, TENNANT CREEK 5758

MAPS 1:25 000:

TECTONIC UNIT(s): TENNANT CREEK INLIER

STRATIGRAPHIC NAME(s) AMF GENERAL TERMS: WARRAMUNGA FORMATION, CAMBRIAN WISO BASIN

AMF TARGET MINERALS: GOLD, COPPER, LEAD, ZINC

AMF GEOPHYSICAL: MAGNETIC INTERPRETATION, GRAVITY SURVEY

AMF GEOCHEMICAL:

AMF DRILL SAMPLING:

HISTORIC MINES:

DEPOSITS:

PROSPECTS:

KEYWORDS: GECKO ROAD, STONEY DAM, WHIPPET EAST, SETTLEMENT, BINARY, ALEXANDER, WHIPPET NORTH, GIBSON CREEK,

COPERNICUS, MONZONITE, MORNING STAR, WHIPPET HILL,  
STUART HIGHWAY, PUMPING STATION, JUNCTION, VIVID,  
MARKER, HAYWARD CREEK, LASSO, STAR WARS, BATTERY  
BLOCK, BILLS, RUSSELL, HANKINSON, TELEGRAPH, BISHOPS  
CREEK, TETLEY, AMSTEL