EL 13/2015 “Frankland River”
Annual Report on Exploration
Nov. 2020 to Nov. 2021
- Zebs Minerals Pty Ltd

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Abstract

Work on EL 13/2015 “Frankland River” Work on EL 12/2015 “Lindsay River” during the reporting year has focused planning and preparation for a VTEM^{TM} airborne EM survey over much of the licence area.

This survey has been in the offing for two years but has been delayed due to timing delays due to preceding clients and the impact of COVID.

The survey is booked for March/April/May 2022 and an application has been made to extend EL 12/2015.

Fieldwork consisted of some reconnaissance sampling over a magnetic highs along a track which branches southward from the Frankland Road, just west of the Frankland Bridge, for magnetic susceptibility measurements.

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1.0 Introduction

1.1 Exploration Rationale

Zebs Minerals Pty Ltd is exploring the Balfour Copper Belt for copper, gold and tin as well as any other commodities of value.

1.2 Location and access

EL 13/2015 “Frankland River” lies in Tasmania’s west coast south of Smithton in the Balfour area.

Access to the tenement is via the Bass Highway to Smithton from Burnie and then on to Balfour via the Western Explorer Highway and the Balfour track. Access within the tenement is very difficult with no vehicular tracks.

1.3 Land status and usage

All of the land within the licence is owned by the crown.

The majority of the licence area is part of the Arthur-Pieman Conservation area with the Donaldson River Nature Recreation Reserve running down the eastern side of the tenement.

1.4 Tenure

The tenement, EL 13/2015 was granted to Zebs Minerals Pty Ltd on 15th November 2016 for a period of five years and applies to all Category 1 minerals. The licence originally covered an area of 247.5 square kilometres**.**

A decision was made in 2020 to relinquish an area of 64 km2 considered relatively non prospective and retain the remaining 183.5 km2 as shown on figure 1.1.

A decision has been made to transfer the tenements into D & B Mining Pty Ltd, a subsidiary of Zebs Minerals Pty Ltd.

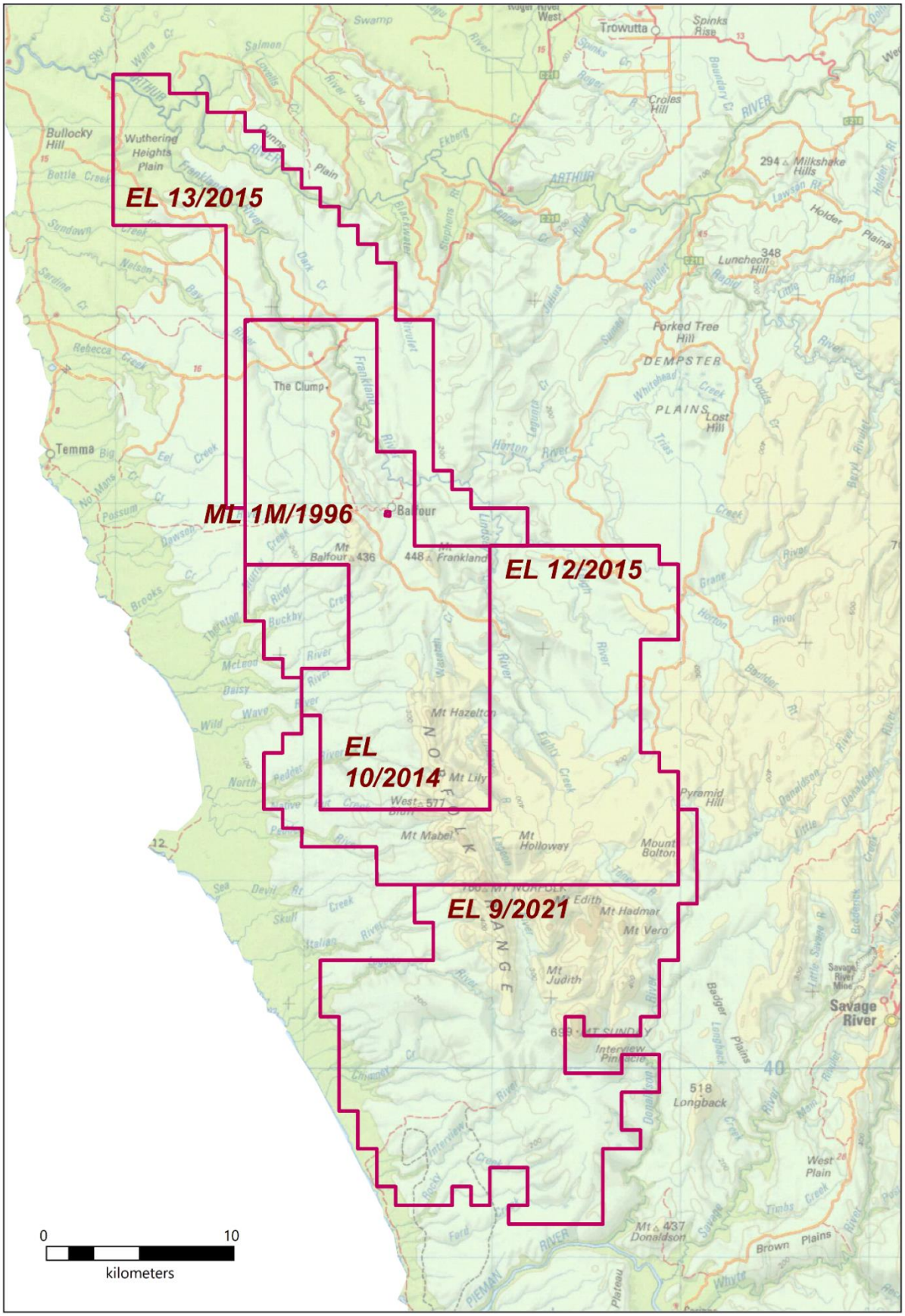

figure 1.1: Location of EL 13/2015 "Frankland River".

1.5 Geology

The geology of EL 13/2015 consists of early Neoproterozoic-late Mesoproterozoic metasediments (and dolerite dykes) of the Rocky Cape Group, with a thin fault bound wedge of the disconformably/unconformably overlying Cryogenian Togari Group near to the northern boundary of the licence). In the southwest of the licence elevated aeolian sands and dunes obscure the underlying Proterozoic rocks. The Proterozoic geology is summarised neatly in figure 1.3.

Structurally the folded Proterozoic rocks are folded are transected by north-northwest trending west-southwest dipping faults which have been shown in a number of instances to be east verging thrusts. The fault which hosts the copper mineralisation at Balfour (on EL 10/2014) is an example of such a thrust.

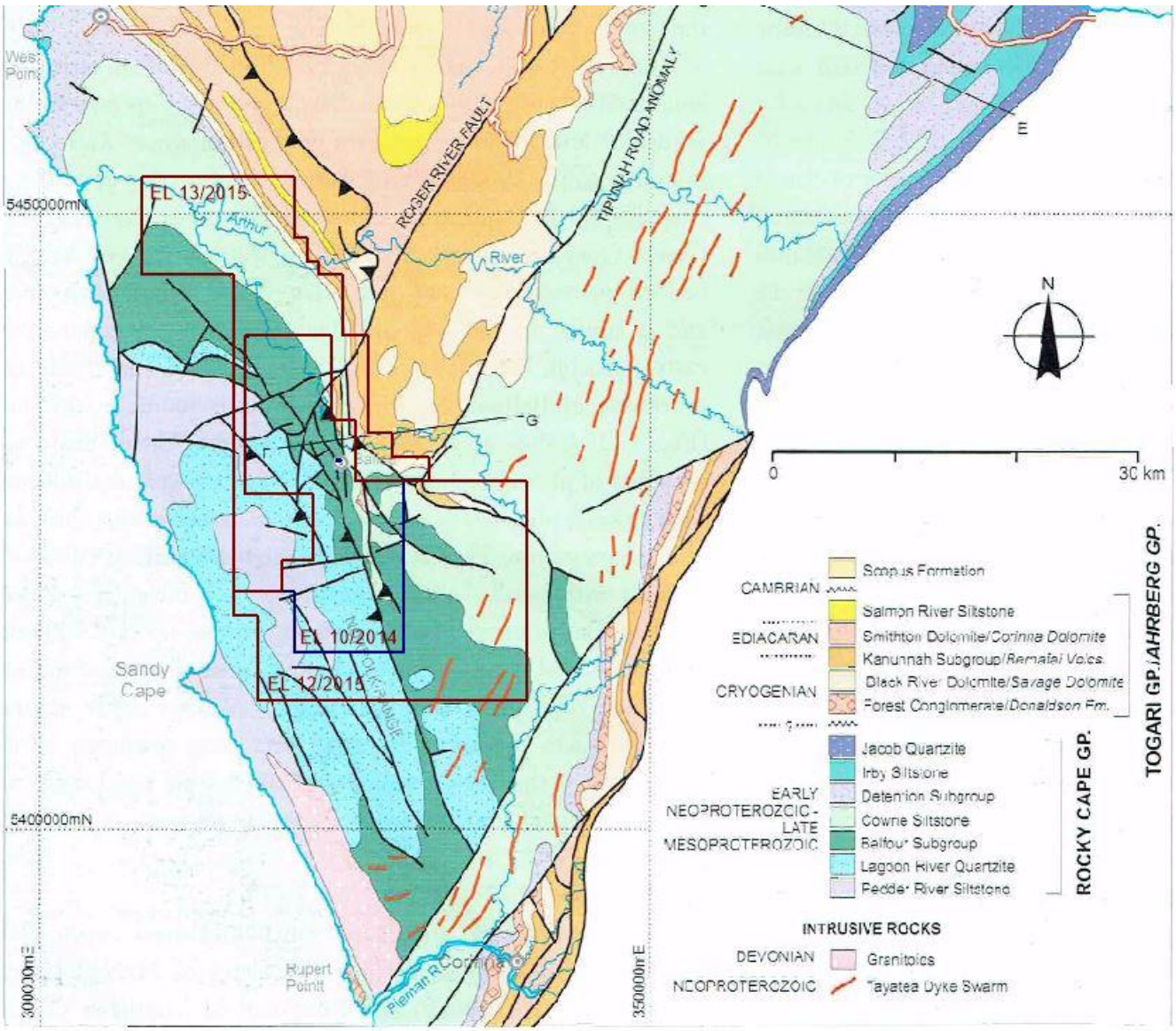

fIgure 1.2: Geology of EL 13/2015 (as originally granted) and associated Zeb's Minerals Pty Ltd tenements (geology after figure 3.8 in Calver et. al. 2014).

The Rocky Cape Group is a sequence of moderately folded silty to sandy shelf facies metasediments, intruded in part by north-northeast trending dolerite dykes.

The Togari Group is a sequence of shelf facies clastics and carbonates with intercalated rift tholeiites which unconformably or disconformably overlies the Rocky Cape Group.

The stratigraphy of both of these Groups is illustrated in figures 1.3 and 1.4.

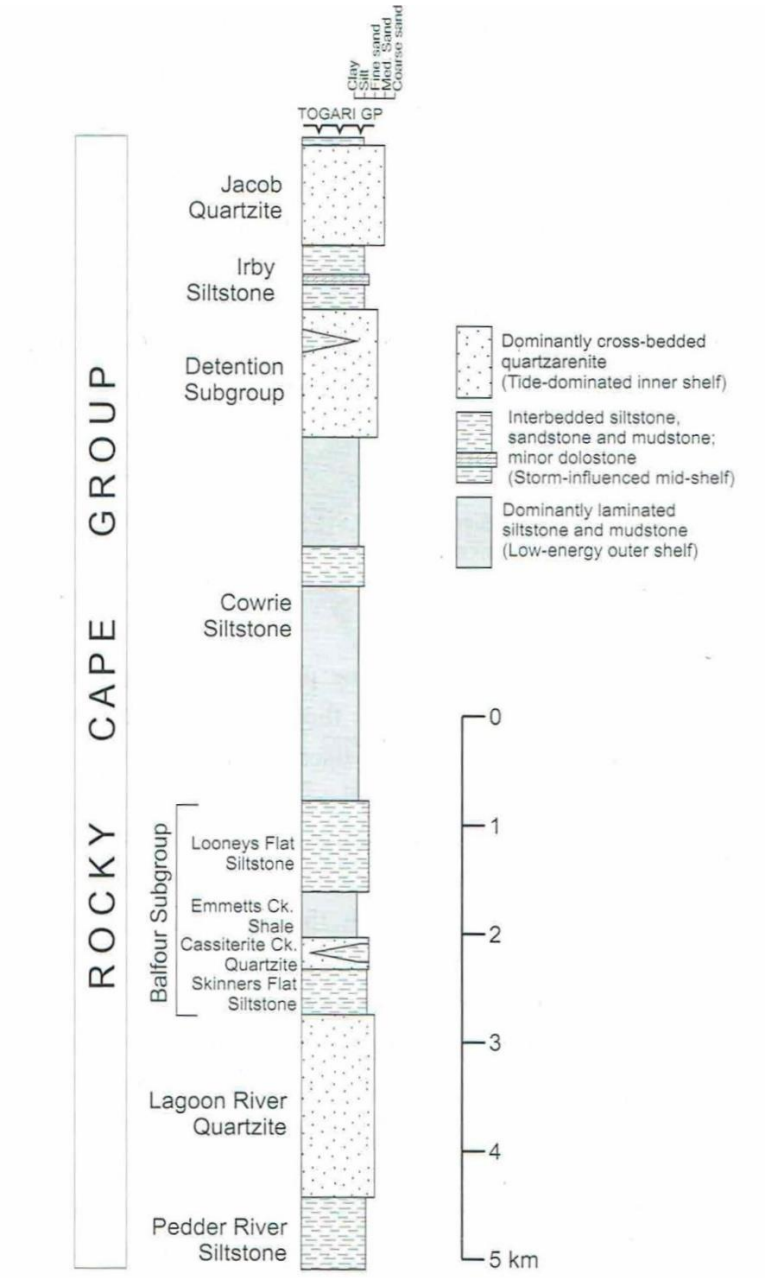

figure 1.3: Rocky Cape Group stratigraphic column (after figure 3.7 in Calver et. al. 2014)

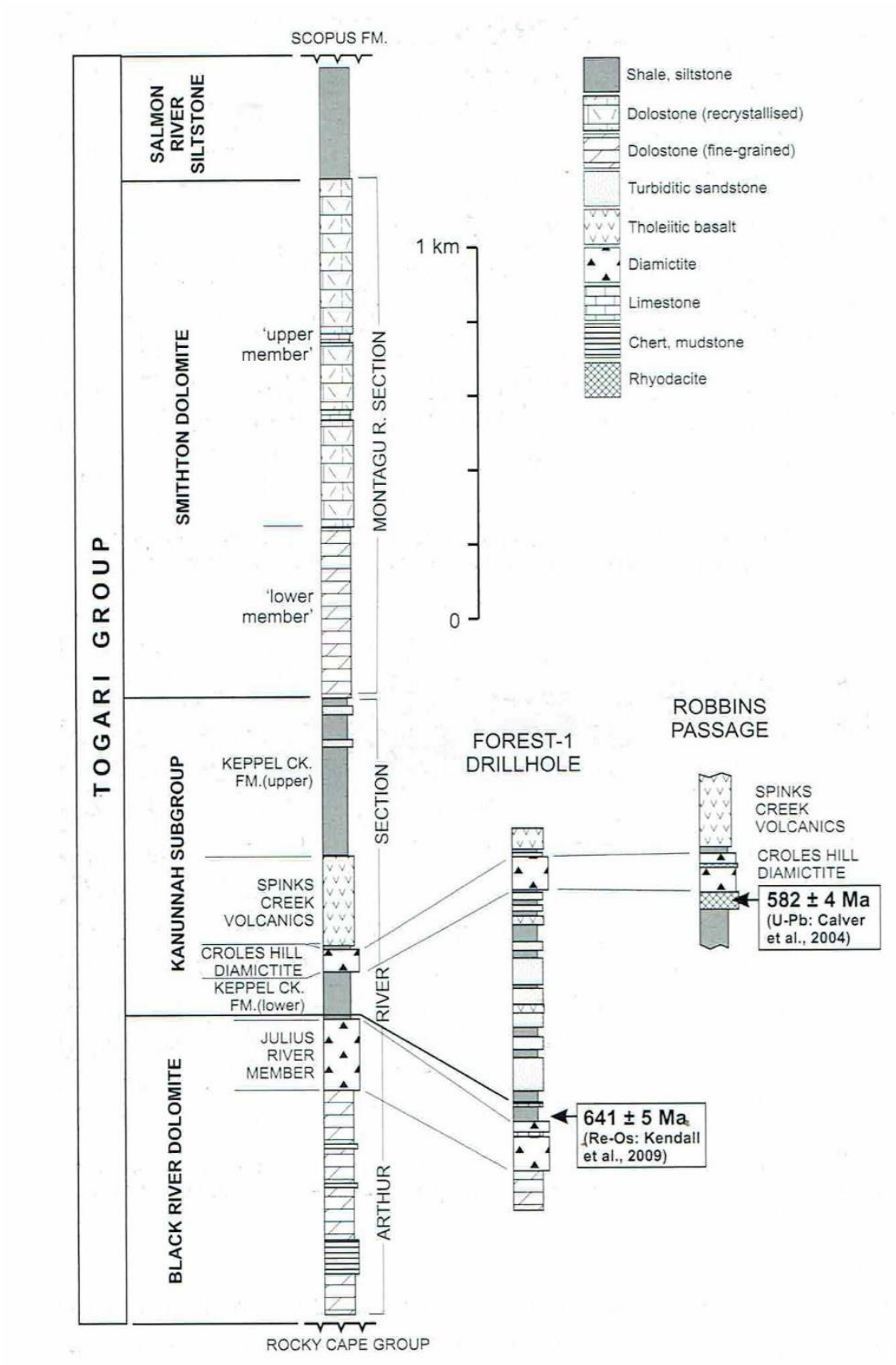

figure 1.4: Togari Group stratigraphic column (after figure 3.29 in Calver et. al. 2014). Note significantly different vertical scale to figure 1.4. The Togari Group is of the order of 3km thick whilst the Rocky Cape Group is of the order of 10km thick.

Gravity data shows that the Middle Devonian Interview River Granite, which outcrops to the southwest of the tenements, also underlies the Balfour area to a depth <1km (as modelled).

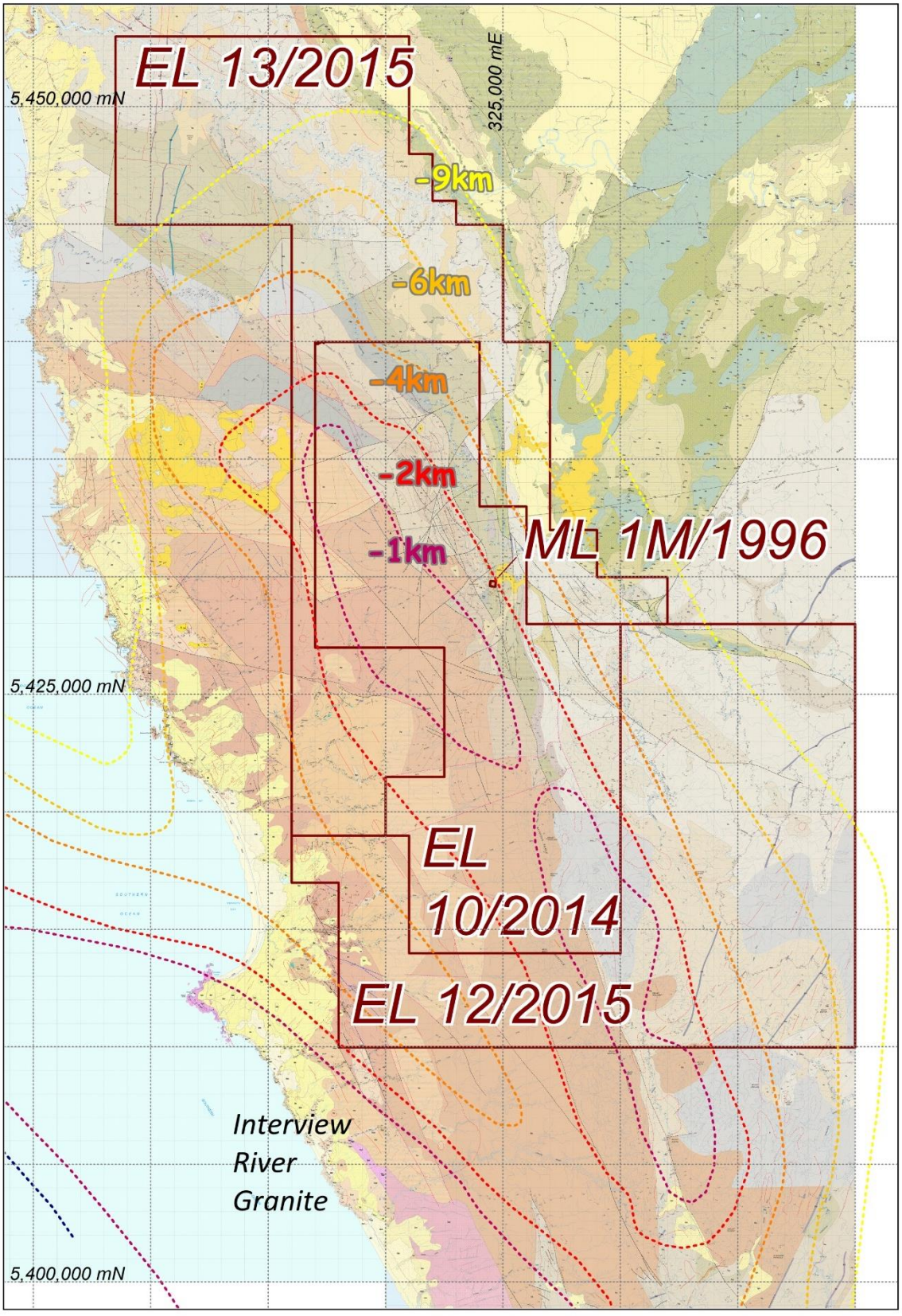

figure 1.5: Mineral Resources Tasmania 1:25,000 sheet series geology with modelled granite depth contours after Everard et. al. 2007.

In the northern part of EL 13/2015 the basement geology is obscured by a veneer of Tertiary gravels, whilst in the easternmost part of the tenement (southeast of the Roger River Fault) the basement is obscured by Quaternary alluvium and a small inlier of Tertiary basalt.

Taheri and Bottrill (2005), citing Reed in Everard *et. al.* (2002) summarise the structural history of the Balfour region as follows. "Two early phases of syndepositional extension were followed by at least four compressional phases of deformation within the area. The first two phase of deformation (D1, D2) are possibly of Cambrian age whereas D3 and D4 are considered to be Devonian in age. D3 is the main deformation phase and is characterised mainly by northwest-trending folding, some cleavage development and major northeast-directed low and high angle thrusts, one of which hosts the copper mineralisation at Murrays Reward mine along the copper belt. East of Balfour east-northeast to northeast trending strike slip faults pre-date late northwest-trending reverse faults. One of these faults hosts vein style Sn-W mineralisation at Specimen Hill."

The Interview River Granite has intruded in the Middle Devonian and likely syn-D3.

For a much more comprehensive understanding of the current understanding of the geology of the region refer to Everard *et. al.* (2007) with Taheri and Bottrill (2005) providing additional information regarding the copper and tin mineralisation in the region.

2.0 Summary of Previous Work

2.1 Prior to Current Tenement

A detailed summary of previous work on the tenement was supplied in MacDonald (2020) and won't be repeated here.

2.2 During Current Tenement - Zebs Minerals Pty Ltd (2014 – 2019)

There has been limited field work on the tenement to date. Most of the work has focused on planning and preparing for a VTEM™ survey. The survey has been ready to fly on two instances to date but has not been flown due to either (1) delays in finishing a preceding survey, and (2) the effects of COVID on the industry, particularly with regards to mobilising to Tasmania.

This planning work has consisted of a desktop compilation of historic exploration work and appraisal of existing geological and geophysical data (magnetics, radiometrics, gravity and a number of airborne EM surveys).

3.0 Exploration completed during the reporting period

Work in the reporting year has focused on the planning for the VTEM^{TM} survey due for March 2022, and in particular determining priorities for surveying.

Work has specifically consisted of (1) advancing the desktop compilation of historic exploration work and appraisal of existing geological and geophysical data (magnetics, radiometrics, gravity and a number of airborne EM surveys), and (2) some ground truthing areas shown to be magnetically anomalous from regional surveys. Rocks were collected from five magnetically anomalous areas where they meet or cross the and slabbed and read for magnetic susceptibility.

4.0 Discussion of Results

4.1 Compilation/Appraisal Work

The historical mapping of Ward (1911) includes a series of tenement charts for each of the copper fields (i.e. Mt Balfour, Mt Hazelton, Toner River, Whales Head (Temma), Copper Reward and Interview River) in his sheets IV, V, VI and VII respectively. These sheets show "lodes" as red lines. These "lodes" aren't copper bearing along the length shown but are structures with copper mineralisation, or the potential for copper mineralisation.

There is quite strong correlation between Ward's "lodes" and faults and shears shown on MRT's 1:25,000 mapping in the northern part of the belt, whilst his mapping of historical "lodes" in the southern part where MRT's mapping is more sparse may indicate the location of further northwest to north-northwest striking thrusts that MRT's mapping has missed.

Superimposing these potentially copper bearing structures onto the regional magnetics shows that these lodes correspond broadly with areas of magnetic anomalism.

Linear magnetic anomalies extend the length of the Balfour copper belt. Whilst there is not a 1:1 correspondence there is a strong broad spatial association.

This coincidence between linear magnetic anomalies and copper mineralisation has been noted by previous explorers, particularly CRAE (Parkinson, 1993) who explained the anomalous trend as being due to a disseminated pyrrhotite bearing siltstone unit at the base of the 'Interview River Siltstone' i.e. basal Balfour sub-group (which should therefore be the Skinners Flat Siltstone as per Calver (*et. al.* 2014) who does not appear to refer to the magnetic nature of the unit) and named the Balfour pyrrhotitic siltstone and mapped accordingly. Parkinson (1993) describes 5% pyrrhotite or magnetite within grey shales or lesser interbedded sandstones. No width is described. CRAE's mapping of this pyrrhotitic siltstone unit largely corresponds with MRT mapping showing Skinners Flat Siltstone as corresponding to the 'pyrrhotitic siltstone' unit.

Parkinson (1993) also states an upper unit of the 'Interview River siltstone' has a similar magnetic band. Northwest of the bridge over the Frankland River the mapped extent of pyrrhotitc siltstone corresponds with Looneys Flat Siltstone, the upper unit of the Balfour Sub-Group.

The relationship between the two does appear to be most probably coincidental.

Copper mineralisation in veins accompanies faults and zones of higher strain in general. The more heterogenous nature of the Balfour Sub-Group and the rheological contrast with the Lagoon River Quartzite appear to have focussed thrusting in the Balfour Sub-Group, and thus juxtaposing copper mineralisation with these magnetic units. However, there is still the possibility for other interactions with iron sulphides a potential trap for copper bearing fluids.

The relationship appears strong enough to justify the flying of the VTEM survey over magnetic anomalies away from known copper workings, particularly the southern end of the Norfolk Range where magnetic anomalism is not associated with historic copper workings.

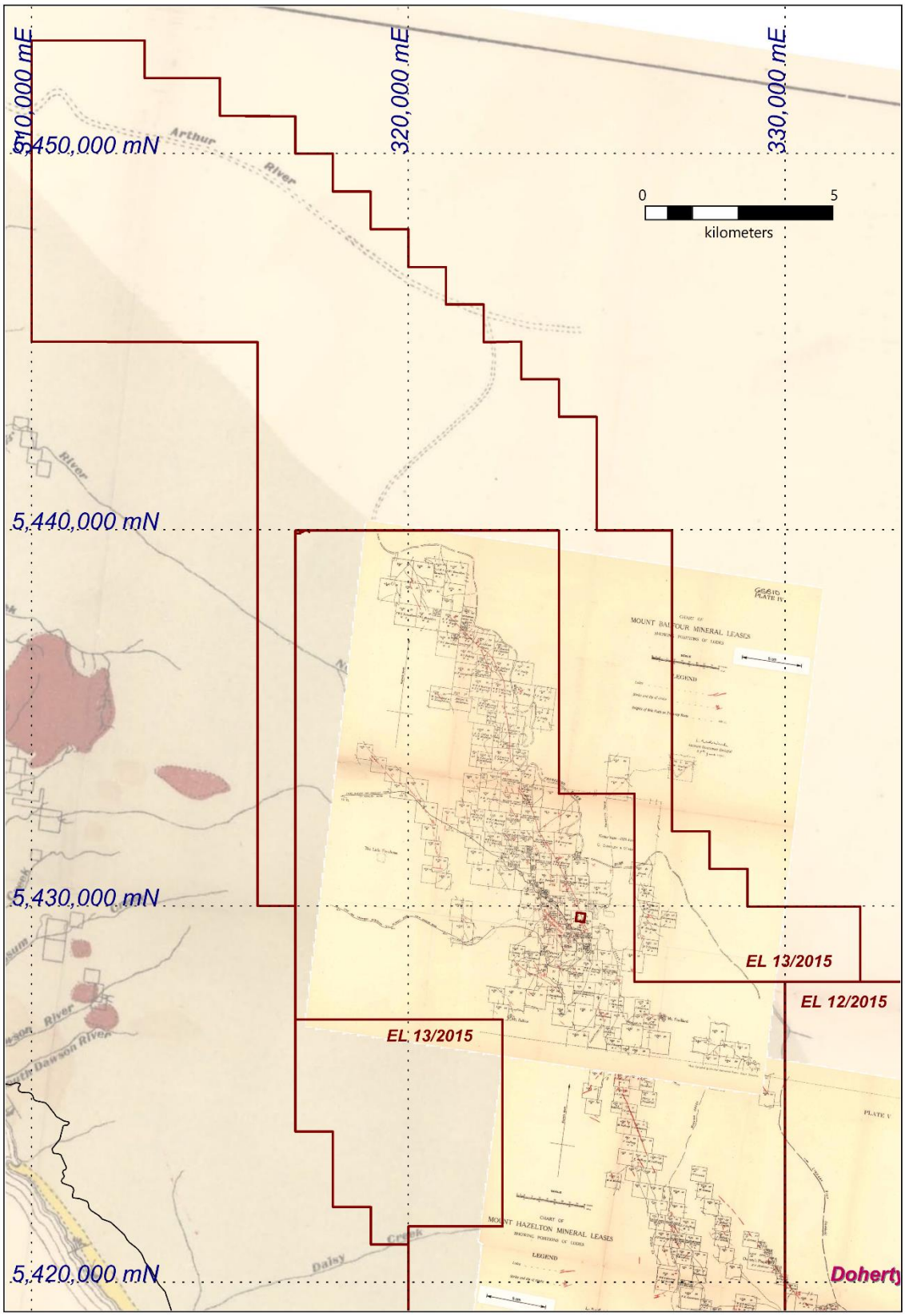

Figure 4.1 Tenement location of EL 12/2015 on a montage of Ward (1911) maps of the tenement position, and location of "lodes" as red lines. These red lines have been copied and superimposed on subsequent figures.

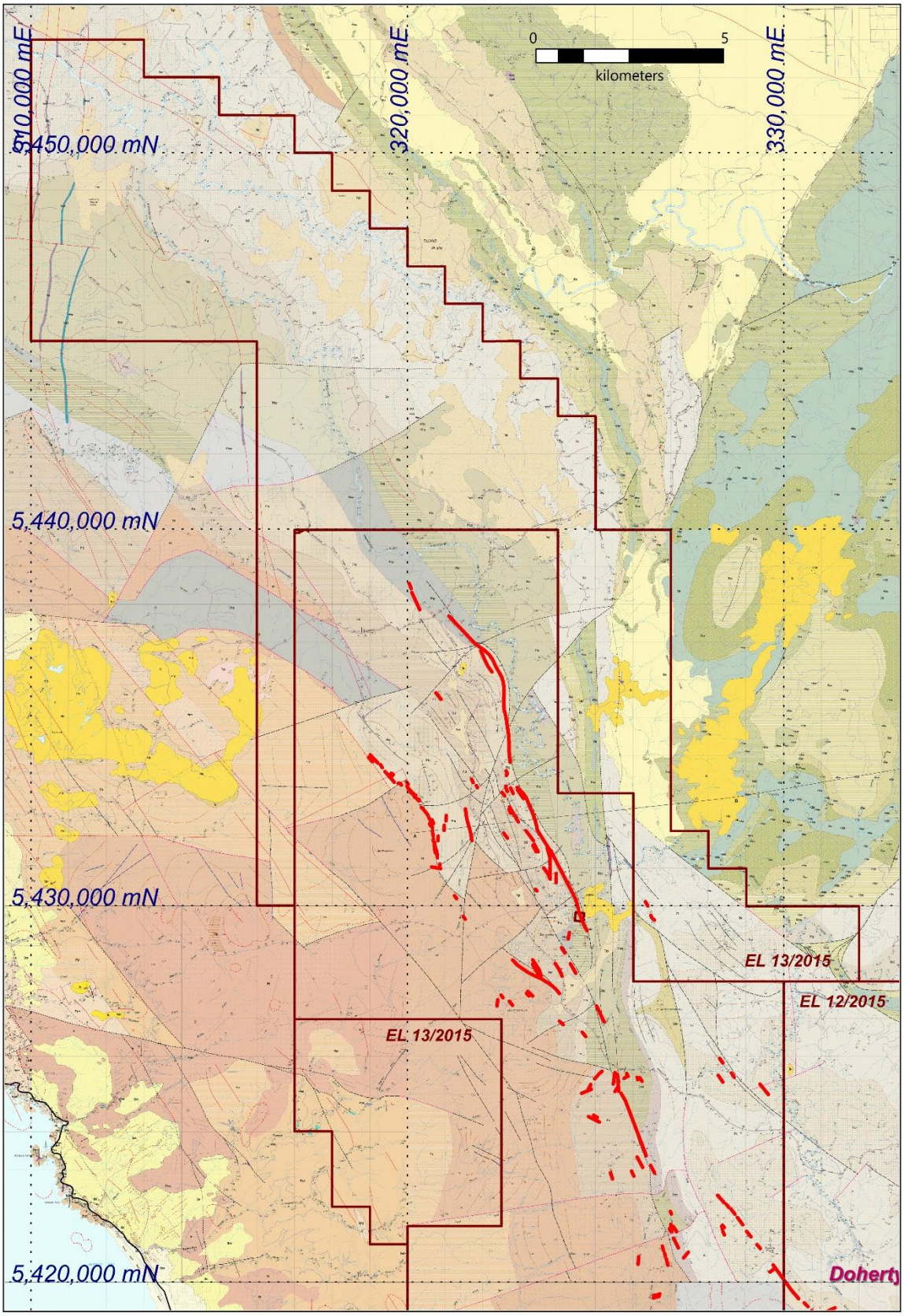

Figure 4.2 Tenement location of EL 12/2015 on MRT's 1:25,000 maps of the tenement position, with Wards (1911) location of "lodes" as red lines. Note the correspondence between "lodes" and mapped faults in the northern part.

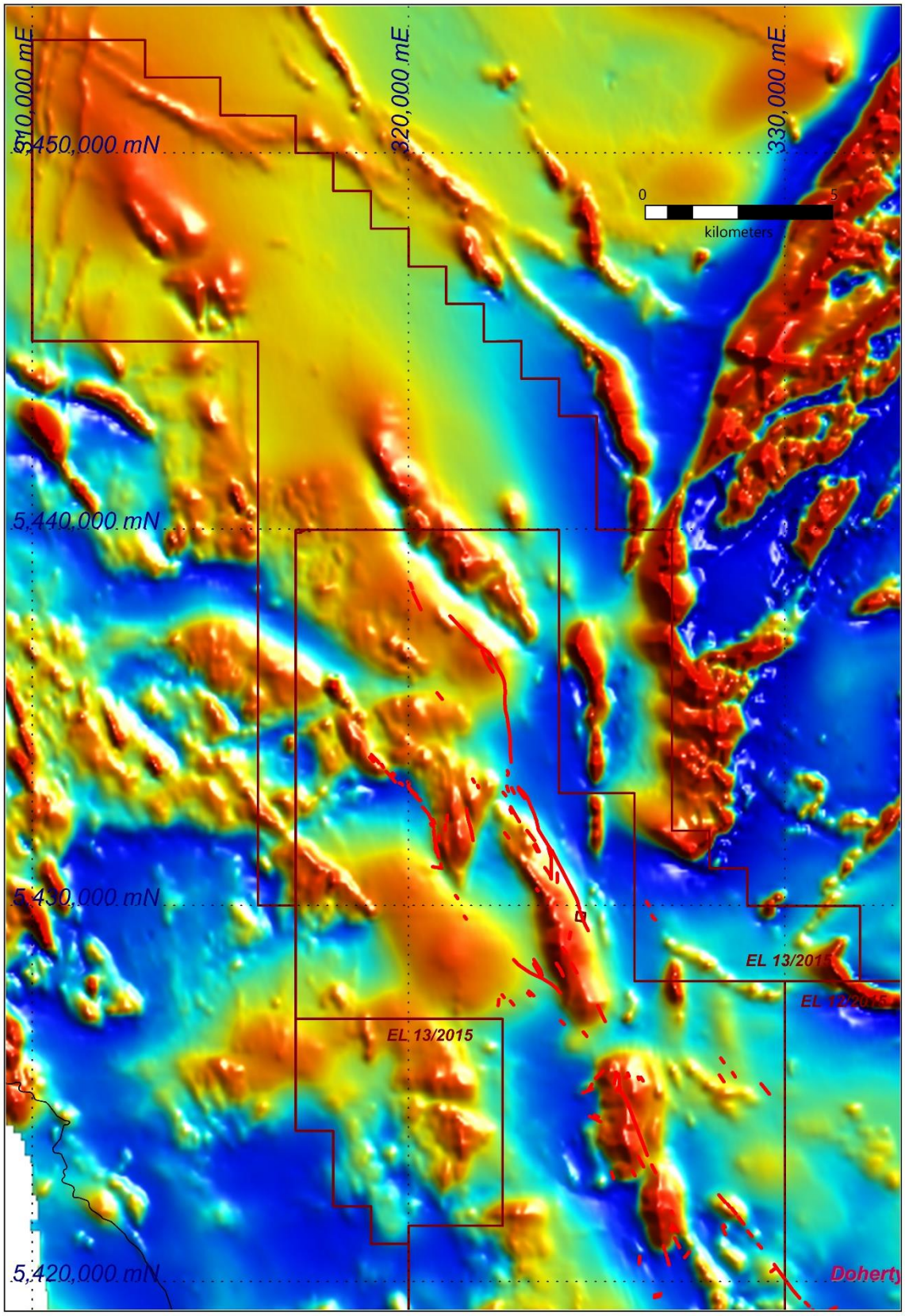

Figure 4.3 Tenement location of EL 12/2015 on TMI RTP, with Wards (1911) location of "lodes" as red lines. Note the broad correspondence between "lodes" and magnetic highs.

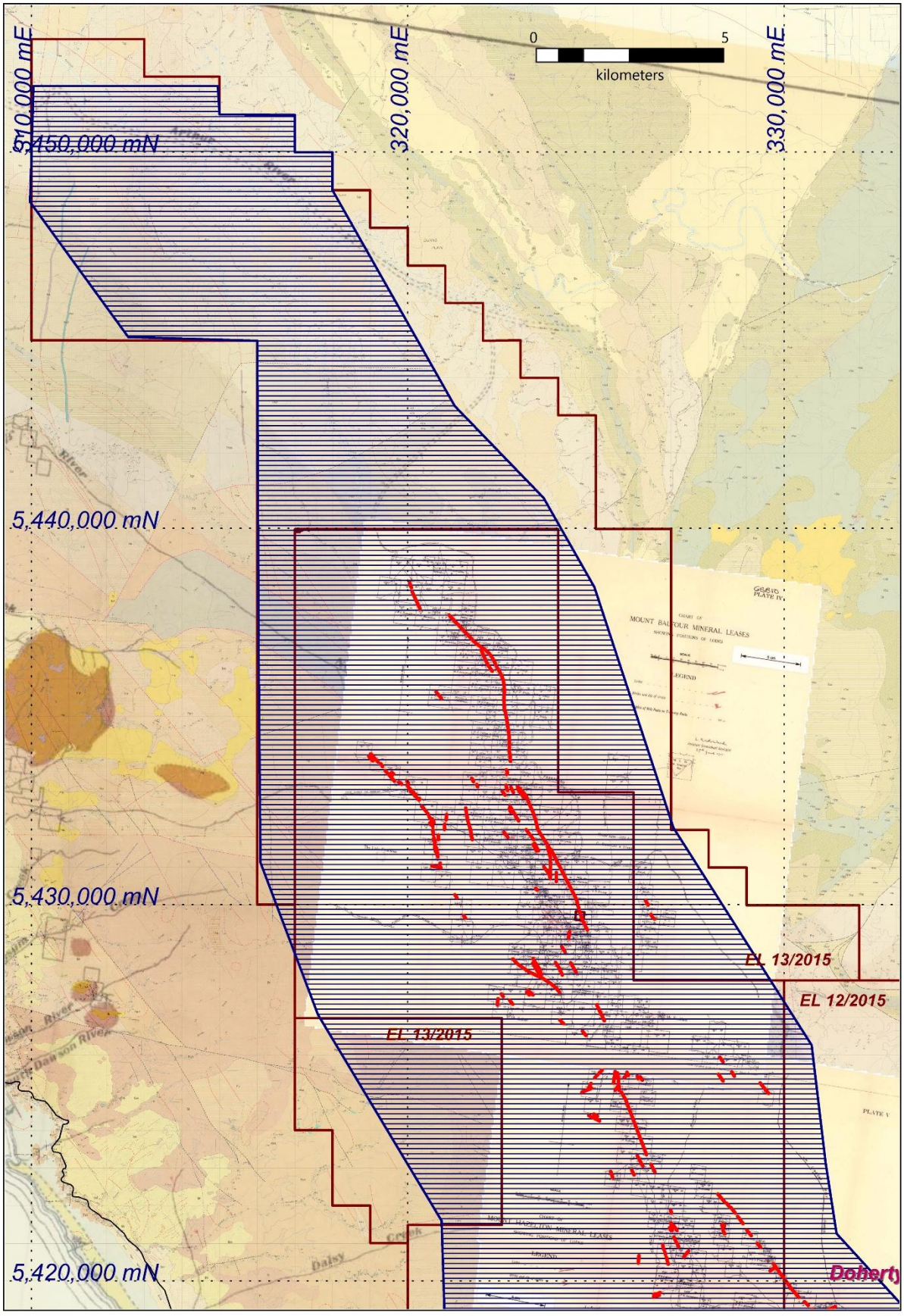

Figure 4.4 Planned VTEM survey area as blue horizontal hatch on Wards (1911) mapsheets.

4.2 Ground Truthing Magnetic Anomalies

Rocks corresponding to a strong northwest linear magnetic high were mapped by CRAE as pyrrhotitic siltstone (Parkinson, 1993) and by MRT as the Looneys Flat Siltstone.

A logging track crosses the anomaly off the Frankland Road, west of the Frankland River bridge allowing ready access to outcrop along the roadside in order to assess the source of the anomalism.

5 rocks were collected from each of two locations within the bounds of the magnetics anomaly.

All rocks sampled are of finely very light grey quartz siltstones and finer grained sandstones with chloritic porphyroblasts.

Magnetic susceptibilities ranged from 0.052 x 10^{-3} to 0.117 x 10^{-3} SI units with a mean of 0.090 x 10^{-3} SI.

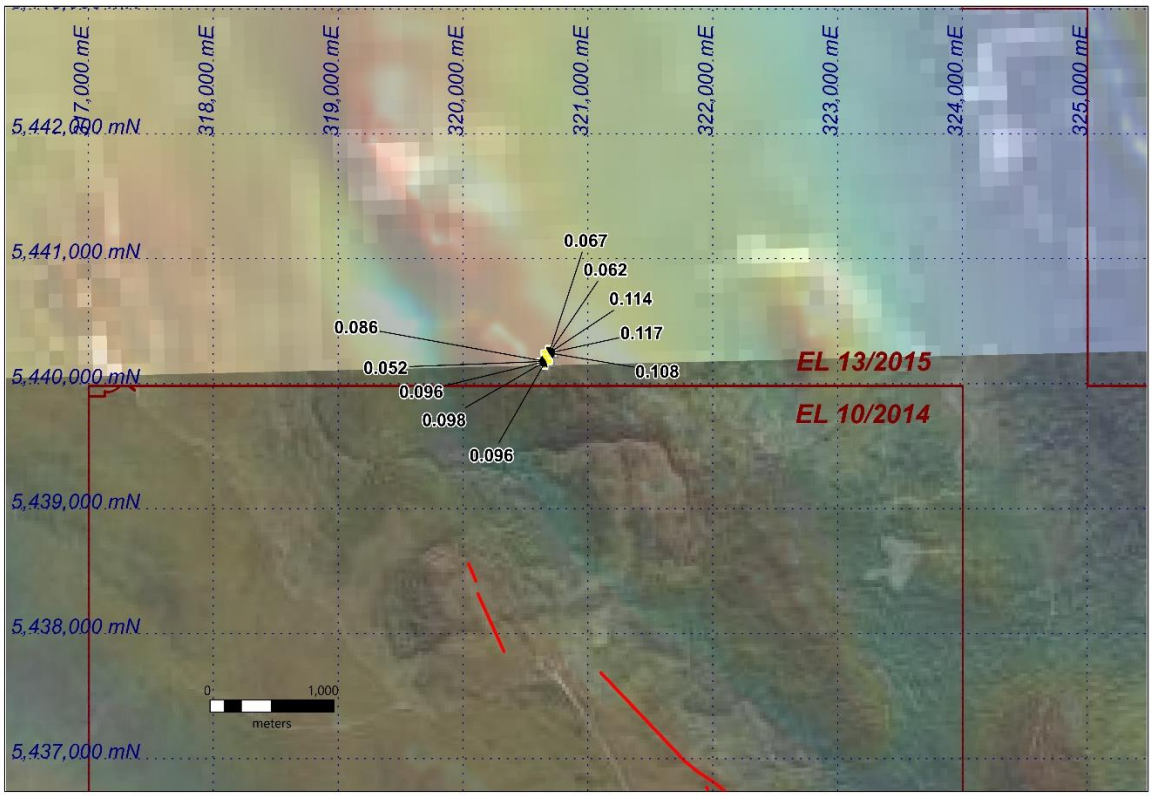

Figure 4.5: Rock sampling locations with magnetic susceptibilities shown (x 10^{-3} SI units) on TMI

Table 4.1: Magnetic Susceptibilites of Collected Rocks

Rock#	MGA94mE	MGA94mN	x 10-3 SI units
R5a	320690	5440246N	0.108
R5b	320690	5440246N	0.117
R5c	320690	5440246N	0.114
R5d	320690	5440246N	0.062
R5e	320690	5440246N	0.067
R6a	320660	5440180	0.096
R6b	320660	5440180	0.098
R6c	320660	5440180	0.096
R6d	320660	5440180	0.052
R6e	320660	5440180	0.086

5.0 Conclusions

The rocks collected on the traverse west of the Frankland River bridge do not appear to explain the aeromagnetic anomaly.

The relationship between copper mineralisation and magnetics is likely coincidental but the relationship still may play further roles in forming economic orebodies.

Planning for the upcoming VTEM survey has included areas of magnetic anomalism away from known copper workings.

6.0 Environment

There has been no environmental impact to date.

7.0 Expenditure

	$
Geology	7,000
Geochemistry	0
Geophysics	8000
Remote Sensing	0
Drilling	0
Gridding	0
Land Access	0
Rehabilitation	0
Feasibility Studies	0
Other	14,000
Administration	2,000
Total	**31,000**

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