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**EL31/2005 STEPHENS RIVULET & ROGER RIVER  
ANNUAL REPORT TO 23.5.09**

Volume 1 of 1

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17.11.09

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## **1 Summary**

- The dominant geological feature in EL31/2005 is the Roger River Fault, which has had a long history of activity including a Neoproterozoic period during the deposition of dolomite, basalts and volcanoclastics that form part of the Togari Group. Mineralising fluids may have circulated in the fault during this Neoproterozoic period or at some later geological time.
- A narrow, three kilometre long zone of silica rocks that coincides with the Roger River Fault at Roger River is interpreted as a relatively high, strongly leached part of an epithermal alteration system that may carry gold at depth.
- Petrological work and further geochemical work on the silica rocks are strongly recommended in order to confirm that the rocks are the product of epithermal alteration.
- Geophysical surveying may provide a guide to mineralisation at depth and to the location of future drill holes.
- Manasia Mining and Metals Ltd have foreshadowed a detailed compilation of the results of previous mineral exploration in EL31/2005 that may identify other targets for detailed work.

## **2 Introduction**

Mineral exploration licence 31/2005 Stephens Rivulet & Roger River of 24 km<sup>2</sup> is for metallic minerals and has an end date of 23.5.2012. It is located in northwest Tasmania, south of Smithton. The licence area extends in a narrow corridor for some 15 km north east from the headwaters of Stephens Rivulet to near Roger River West and there is a separate, smaller block further north at Roger River (Figure 1). Access is provided by a bitumen road from Smithton to Roger River (20 km) then by all-weather roads along the entire length of EL31/2005.

The categories of land tenure within the licence area (Figure 5) include State Forest, Forest Reserve and Private Land. Track cutting may be required in forested areas for sampling, drilling, etc. There are no parts of the licence area that are excluded from exploration (Figure 6) though a small Public Reserve and a small Private Reserve at Roger River may require special arrangements.

This report outlines Manasia Mining and Metals Ltd's exploration philosophy for the coming period of work in EL31/2005. The report also provides brief summaries of the geology and of previous exploration, and identifies some areas for possible future work.

## **3 Exploration philosophy**

Manasia Mining and Metals Ltd has stated that its proposed exploration in EL8/2006 will be based on the following themes.

1. A detailed compilation of historical open file data.

2. A reinterpretation of geology from airborne geophysical data.
3. Delineation of field exploration targets from the data review.
4. Follow up geochemical sampling and geophysical surveying (possibly drilling) on the Whitewater North, Quarry and Church prospects.
5. The primary target commodity is gold (+copper+nickel).

#### **4 Geology**

Along its entire cumulative length of 17 km EL31/2005 straddles the Roger River Fault (Figure 2). This fault obliquely transects the eastern limb of a north plunging synclinorium in a unit of Neoproterozoic rocks called the Togari Group, which is underlain with mild unconformity by the Middle Proterozoic Rocky Cape Group, and overlain with apparent conformity by the Early Cambrian Salmon River Siltstone and the Middle Cambrian Scopus Group (Everard et al, 2007).

Most of EL31/2005 is occupied by formations belonging to the Togari Group. This group has a discontinuous basal formation of shallow water, quartzose sandstone and conglomerate called the Forest Conglomerate which is overlain by the Black River Dolomite then the Kanunnah Subgroup followed by the Smithton Dolomite. The Kanunnah Subgroup includes the predominantly volcanoclastic Keppel Creek Formation and the intercalated Croles Hill Diamictite and basaltic Spinks Creek Volcanics (Figure 2).

Through much of EL31/2005 the Roger River Fault has juxtaposed Kanunnah Subgroup, to the east, with Smithton Dolomite to the west though the Smithton Dolomite is largely obscured by residual soil and Quaternary alluvium. Although the Roger River Fault has west-side-down displacement the increase in thickness of the Kanunnah Subgroup and Black River Dolomite from west to east across the fault suggests that the fault was active with east-side-down movement during the deposition of these units (Everard et al, 2007).

In the northern block of EL31/2005 there is a belt of silica rocks that is about 3 km long and up to 300 m wide. These rocks are interpreted as being part of an alteration zone associated with the Roger River Fault (Figure 7; Turner, 2003). The silica rocks are of fine to medium grain size, strongly leached and exhibit textures that may be massive, brecciated or vuggy.

In the southern part of EL31/2005 and elsewhere in the general district there are scattered residual deposits of silica in the form of sand and silt that are known locally as silica flour. Some of these deposits are being commercially exploited because of their unusually high purity. The silica flour appears to have been derived from silicified Smithton Dolomite and contrasts with the hard, coherent silicification at Roger River. Hard, coherent silicification is also common in the Black River Dolomite and the silica rocks at Roger River were interpreted as silicified Black River Dolomite by Lennox et al (1982).

## 5 Exploration models and previous exploration

Previous explorers including CRA Exploration (Parkinson, 1994), Morritt Holdings (Morritt, 1997) and Greenstone Resources (Davis in Turner, 2003) have put forward a variety of exploration models for the district in which EL31/2005 is located. Mineral Resources Tasmania provides a review of possible exploration models in Everard et al (2007). Models that may be relevant to EL31/2005 include the following.

- Iron formation gold (Homestake) or copper-gold (Selwyn/Starra).
- Sediment hosted copper (Kupferschiefer/White Pine)
- Zinc in carbonate adjacent to the Roger River Fault (Mississippi Valley/Irish Style)
- Epithermal gold in, or near, the Roger River Fault (Carlin)

Pacific-Nevada Mining Pty Ltd carried out mapping, soil sampling and rock chip sampling over a hematite-magnetite-pyrite iron formation in the Keppel Creek Formation at Canadian Creek (Westbrook, 1999). This work extended into the northern end of the southern block of what is now EL31/2005. It was concluded that the general lack of gold in soils was not encouraging of the Pacific-Nevada exploration models. The Pacific-Nevada stream sediment sampling in the area corresponding to EL31/2005 did not lead to any copper targets that were followed up.

The Smithton Dolomite is a possible host for zinc mineralisation. However, there are no known surface expressions of such mineralisation. Everard et al (2007) note that the Mississippi Valley style of deposit generally gives poor geochemical and geophysical responses and that grid drilling has been advocated as an appropriate exploration technique.

Consultants to Pacific-Nevada (Ken Snyder, Franco-Nevada) and to Greenstone Resources (Geoff Davis, see Radke & Davis, 1990) advocated an epithermal origin for the silica rocks at Roger River (Turner, 2003). Bulk composition, textures and trace element geochemistry suggest a relatively high, strongly leached level in an epithermal alteration system. Low level gold to 5 ppb is sporadically present. Arsenic is usually present at levels of up to 100 ppm, but may exceed 1000 ppm in uncommon, iron-rich rocks. Consistent with strong leaching, the base metal values are generally exceedingly low in both the silica rocks and their derived soils.

At the Quarry Prospect near the southern end of the Roger River alteration zone a small patch of well crystallised barite with ochreous iron minerals was found in an otherwise pale, massive and brecciated, saccharoidal quartz rock (Figure 7- Sample Numbers 3083, 3084). Analysis of sample 3083 returned 1 ppb Au, 102 ppm As, 22 ppm Sb, 5.97% Ba and 1.48 ppm Hg. Sample 3084 returned similar values. Only two other samples were analysed for Hg (3075, 3079) and both were anomalous.

EL31/2005 corresponds almost exactly to the initial extent of a previous licence EL61/1994. Exploration in EL61/1994 for silica flour resulted in the

identification of a deposit on Blackwater No 1 Spur Road, just south of the Arthur River (Turner, 2005). This deposit is now held under mining lease (Figure 6) by Tasmanian Advanced Minerals of Wynyard.

## **6 Future work**

A detailed compilation of all previous mineral exploration data for EL31/2005 is to be prepared by Manasia Mining and Metals Ltd. There is considerable stream sediment data, rock chip data and some soil data as well as a variety of airborne geophysical data (Figures 3, 4). New targets for detailed follow up work may arise from the compilation.

Further assessment of the zone of silica rocks at Roger River is recommended. Spacing of the existing sample lines is about 400 m (Figure 7) so infill lines are desirable. Petrological work to better specify the nature of the alteration is very strongly recommended. Comparison with known epithermal systems may provide a guide to the depth of drilling that will be required to test for economic mineralisation. Also, a review aimed at identifying the most appropriate geophysical method to investigate the subsurface nature of the zone of silica rocks is strongly recommended.

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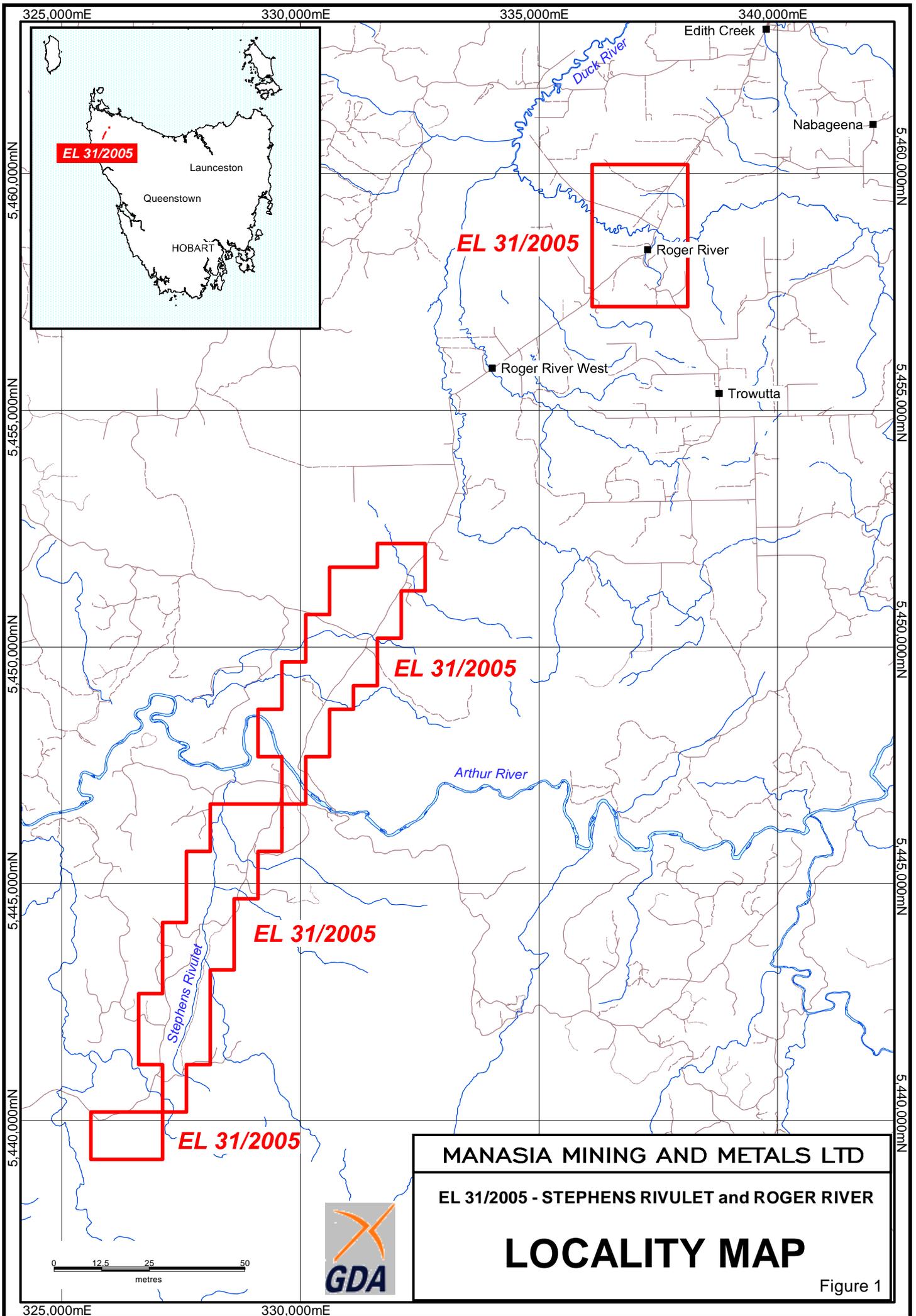
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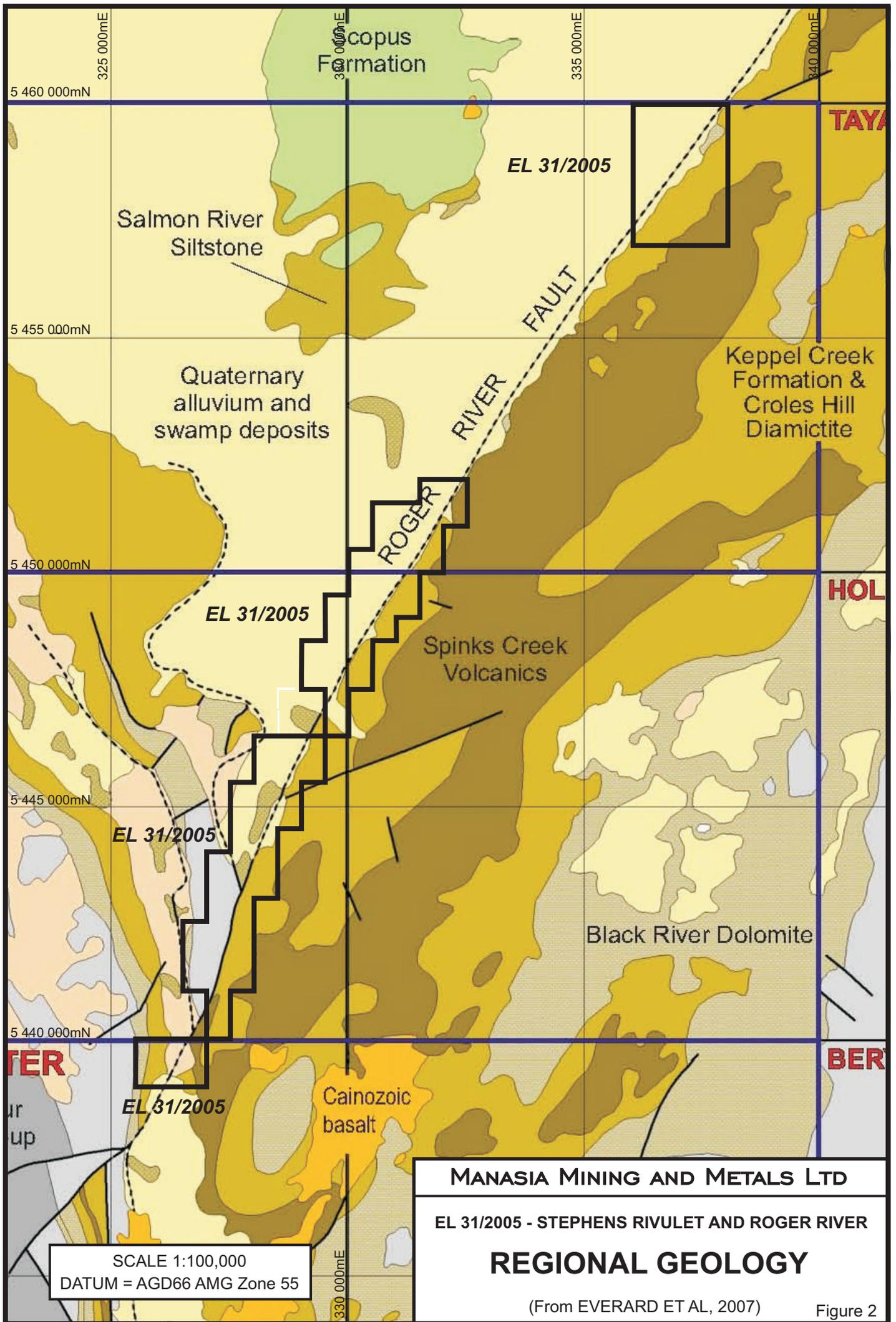


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EL 31/2005 - STEPHENS RIVULET and ROGER RIVER

# LOCALITY MAP

Figure 1



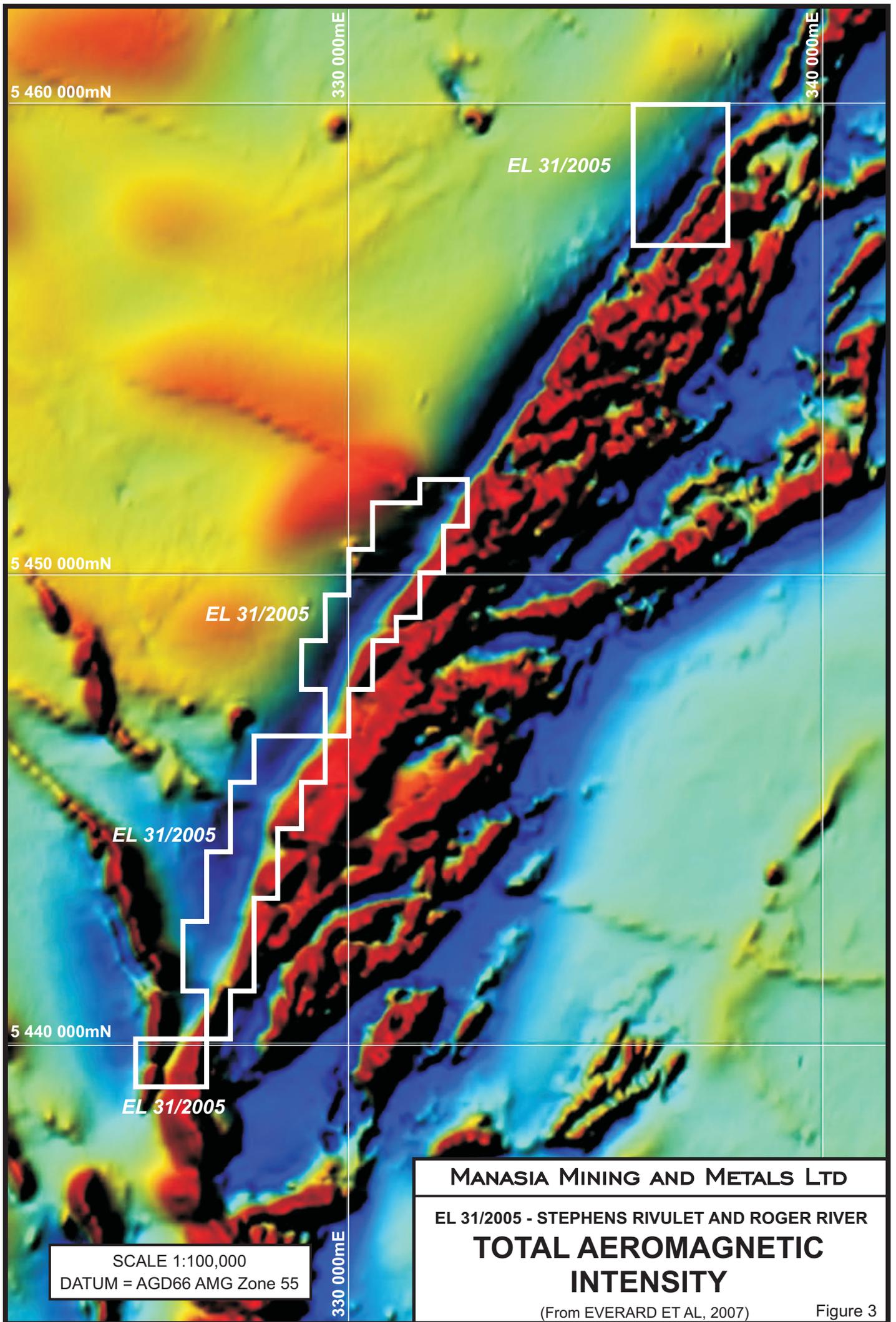
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**REGIONAL GEOLOGY**

(From EVERARD ET AL, 2007) Figure 2



5 460 000mN

330 000mE

340 000mE

EL 31/2005

5 450 000mN

EL 31/2005

EL 31/2005

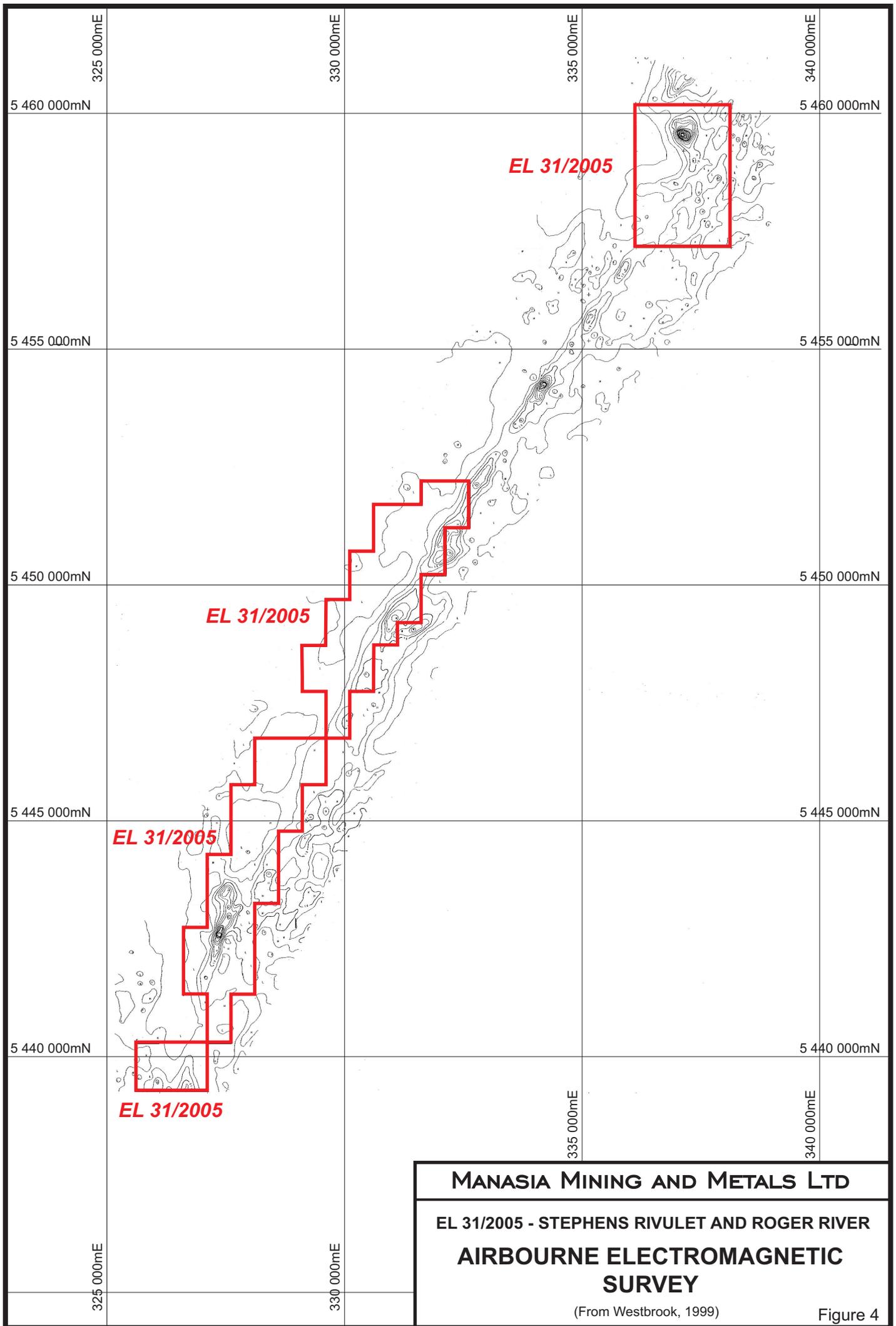
5 440 000mN

EL 31/2005

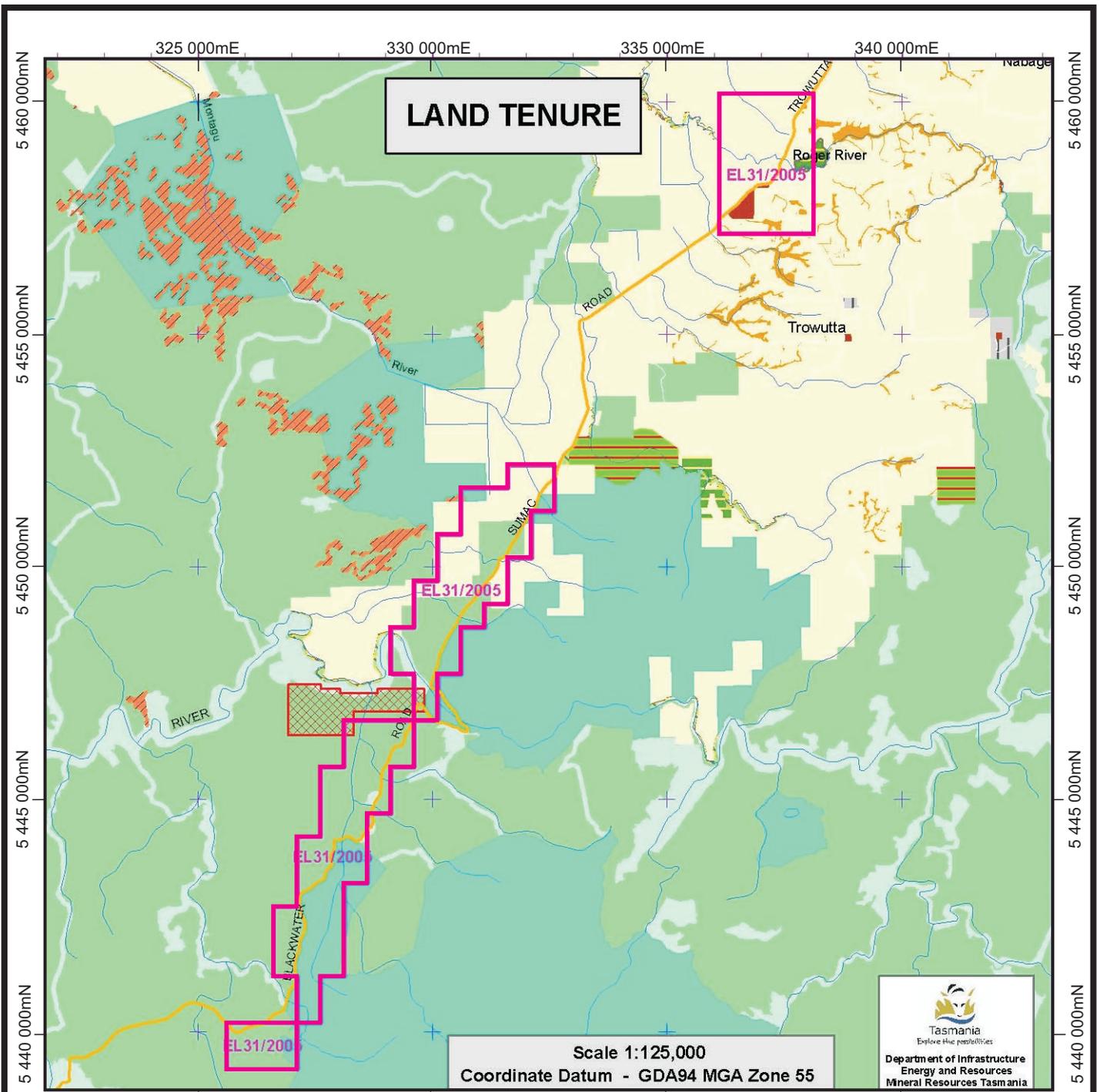
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**TOTAL AEROMAGNETIC INTENSITY**  
(From EVERARD ET AL, 2007) Figure 3



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**EL 31/2005 - STEPHENS RIVULET AND ROGER RIVER**  
**AIRBOURNE ELECTROMAGNETIC SURVEY**  
 (From Westbrook, 1999) Figure 4



**Land Tenure / Special Management Areas (Guide Only)**

*  Mining Lease	Aboriginal Administered Land	Proposed Nature Reserve - CLAC
Administratively Excluded Areas	Indigenous Protected Areas	Regional Reserve
Fossil Site	Protected Area	Proposed Regional Reserve - CLAC
RAMSAR Site	Wellington Park	State Reserve
Gas Pipeline Corridor	Conservation Area - Unavailable under MRDA	Proposed State Reserve - CLAC
*  Forest Communities Managed by Prescription	Conservation Area	*  Forest Reserve
Aurora / Hydro / Transend Lands	Proposed Conservation Area - CLAC	*  Forest Reserve - Unavailable under MRDA
Commonwealth Land	Game Reserve	*  Informal Reserve - State Forest / FT Managed Land
*  Private Land	Proposed Game Reserve - CLAC	*  State Forest
*  Private Reserve	Historic Site	Crown Land - Authority Land
Private Reserve - Availability Unknown	Proposed Historic Site - CLAC	Crown Land (DPIWE)
Private Reserve - Unavailable under MRDA	National Park	
*  Informal Reserve (Forestry Operations) - Private Land	Proposed National Park - CLAC	
*  Public Reserve	Nature Recreation Area	
Proposed Public Reserve - CLAC	Proposed Nature Recreation Area - CLAC	
	Nature Reserve	

**Relevant tenement land tenure / land management area indicated \***  
 Note: Land Tenure is derived from the LIST and other sources and may be incomplete. Not all Land Tenure depicted in legend may appear on the map.

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 DATUM = GDA94 MGA Zone 55

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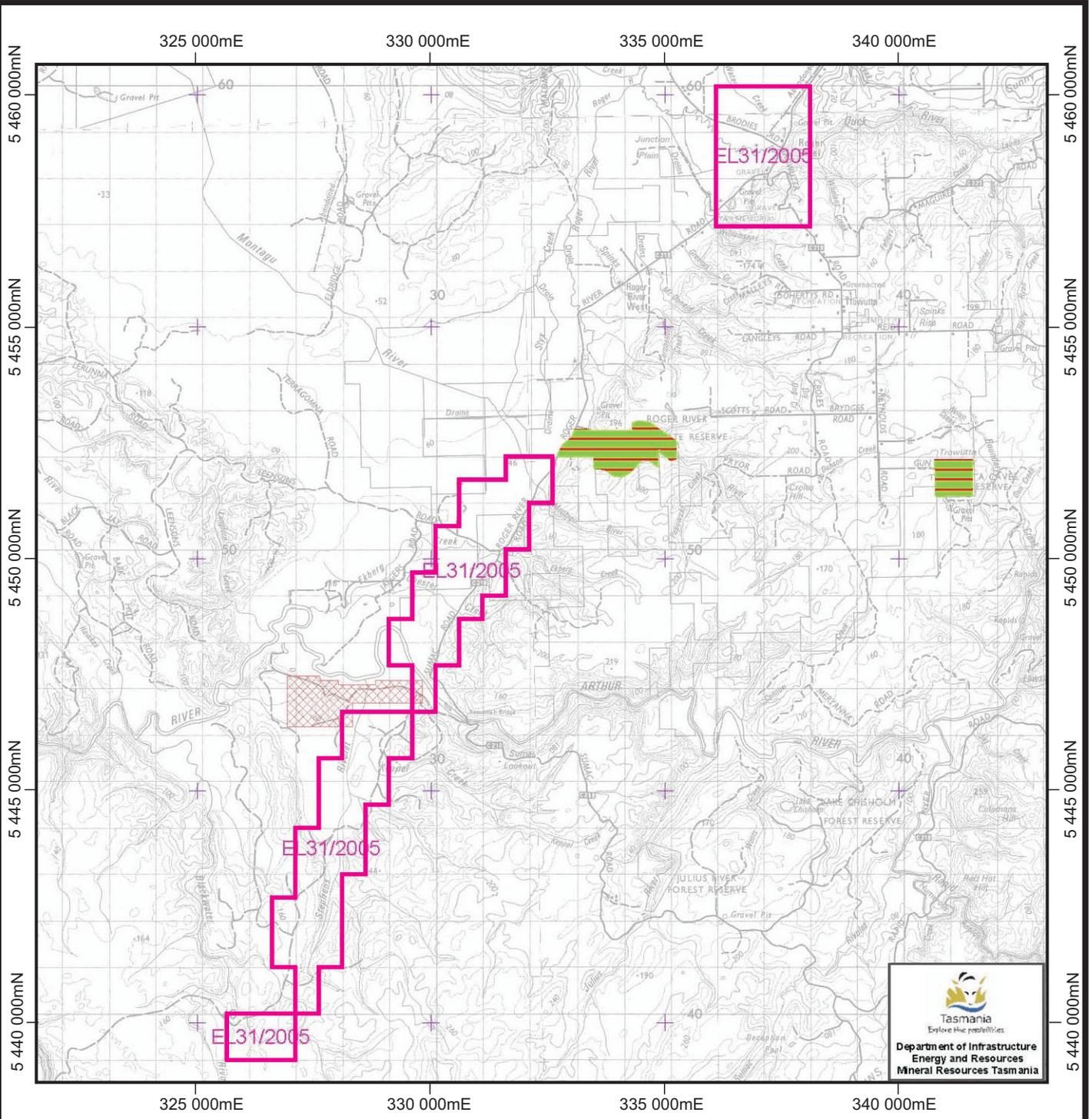
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**EL 31/2005 - STEPHENS RIVULET AND ROGER RIVER**

**LAND TENURE**

MINERAL RESOURCES TASMANIA, 2009

Figure 5



**Excluded Areas**

Exempt Area	State Reserve
Mining Lease	Proposed State Reserve - CLAC
Retention Licence	Nature Reserve
Fossicking Area	Proposed Nature Reserve - CLAC
Fossil Site	National Park
Administratively Excluded Areas	Proposed National Park - CLAC
RAMSAR Site	Historic Site
Gas Pipeline Corridor	Proposed Historic Site - CLAC
Wellington Park	Game Reserve
Indigenous Protected Areas	Proposed Game Reserve - CLAC
Commonwealth Land	Conservation Area - Unavailable under MRDA
Private Reserve - Unavailable under MRDA	Forest Reserve - Unavailable under MRDA

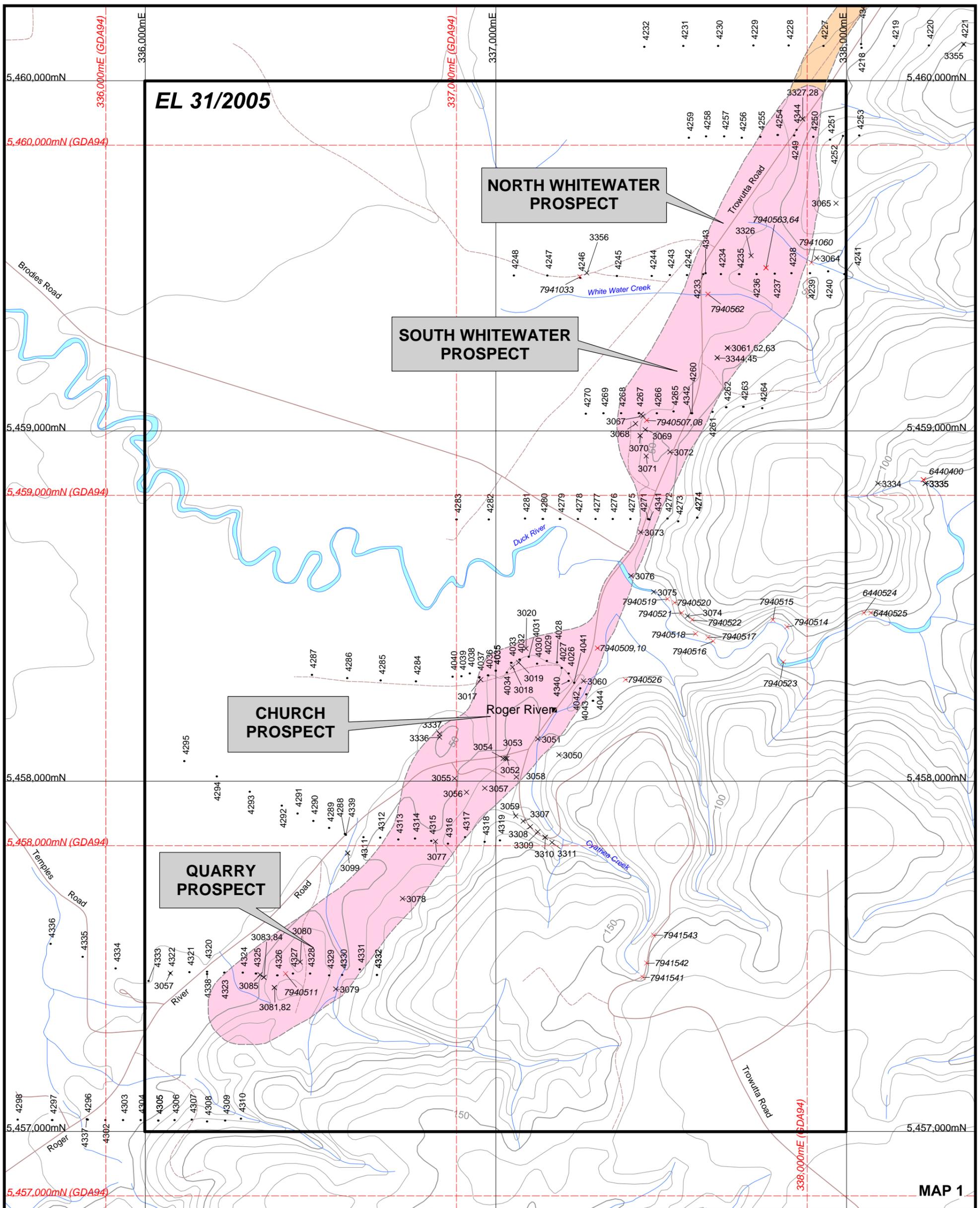
**Relevant tenement land tenure / land management area indicated \***

Note: Land Tenure is derived from the LIST and other sources and may be incomplete. Not all Land Tenure depicted in legend may appear on the map.



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 DATUM = GDA94 MGA Zone 55

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**EL 31/2005 - STEPHENS RIVULET AND ROGER RIVER**  
**AREAS EXCLUDED FROM**  
**MINERAL EXPLORATION**  
 MINERAL RESOURCES TASMANIA, 2009 Figure 6



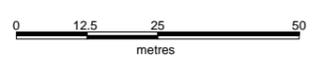
MAP 1

**LEGEND**

- Widespread silicification
- Minor silicification

**KEY TO ASSAYS**

- 4229 Greenstone Resources Soil Sample
- × 3064 Greenstone Resources Rock Chip Sample
- × 7940562 Pacific Nevada Rock Chip Sample



**NOTE:**  
Map data in AGD66 AMG Zone 55 Datum  
GDA 94 Grid overlain in red

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**GREENSTONE RESOURCES NL**  
 EL 31/2005 - STEPHENS RIVULET and ROGER RIVER  
 ROGER RIVER ALTERATION ZONE  
**ANALYTICAL RESULTS FOR  
 FOR SOILS AND ROCKS**  
**SAMPLE NUMBER and LOCATION**

By: Nic Turner 26/01/2002 Figure 7