



**Lake Rosebery EL 41/2010**

**ANNUAL REPORT  
FOR THE PERIOD ENDING 30<sup>th</sup> May 2014**

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## CONTENTS

1. SUMMARY .....	4
2. INTRODUCTION .....	5
3. LAND TENURE.....	6
4. GEOLOGY .....	7
5. CURRENT EXPLORATION .....	10
Work Completed in the 2013-2014 Period .....	10
6. PREVIOUS EXPLORATION .....	13
7. ENVIRONMENTAL.....	15
8. CONCLUSIONS AND RECOMMENDATIONS .....	15
9. EXPENDITURE .....	16
10. REFERENCES .....	17

## LIST OF TABLES

*Table 1*      Expenditure

## LIST OF FIGURES

<i>Figure 1</i>	Location of EL41/2010 Lake Rosebery	1:125,000
<i>Figure 2</i>	Land Tenure of EL41/2010	1:50,000
<i>Figure 3</i>	25K Geology of EL41/2010	1:50,000
<i>Figure 4</i>	3D section of SWIR data below Rosebery fault	
<i>Figure 5</i>	3D section of Z lens	
<i>Figure 6</i>	LIDAR and Ortho-photography	

## APPENDICES

<i>Appendix 1</i>	25K geology legend
<i>Appendix 2</i>	3D seismic Report
<i>Appendix 3</i>	SWIR metadata

## DIGITAL DATA

### Product

*Drill Hole data, Surveyed Collars*

*3D Seismic Report*

*SWIR data, Raw*

*Report and Appendix*

*LIDAR (Booth C, 2014 MMG LIDAR and Photography Report)*

*Photography (Booth C, 2014 MMG LIDAR and Photography Report)*

### Format

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## **1. SUMMARY**

Activities during the period focused on collecting data to the south of EL41/2010 on the mine lease. This data was used to characterise the lithologies within the Rosebery sequence as well as lithologies within the Rosebery-Marion oak domain similar to work done on the Lake Rosebery lease in the previous reporting period. Over 80000 spectra and nearly 8000 samples have been collected thus far.

The 3D seismic Report was completed, but at this stage no follow up work is planned.

Aerial photography and LIDAR was captured in January 2014.

In the next 12 months exploration will continue to focus on Rosebery-Marion oak Domain incorporating the small window of Dundas Group rocks north of the Bastyan Dam which lies within EL41/2010.

## 2. INTRODUCTION

Exploration activities undertaken on EL 41/2010 Lake Rosebery during the period April 2012 to May 2013 are detailed herein.

Access to the tenement is via the Rosebery Mine lease 28M/1993 south of Lake Rosebery (Figure 1). A network of 4WD tracks gives access for near mine extension of the Rosebery ore body. The Pieman Road enables access to areas north of Lake Rosebery through a series of unsealed Hydro Electric Commission roads.

MMG's main exploration target within EL 41/2010 is Cambrian hosted Rosebery style Zn–Pb–Cu–Au rich VMS subsurface seafloor replacement style mineralisation and/or Hellyer type seafloor mound-type mineralisation hosted in the Mount Read Volcanic (MRV) belt. The tenement covers a generally N-S striking section of the Central Volcanic Complex (CVC).

MMG recognise the potential of the Lake Rosebery tenement for near mine resource extension of the Rosebery deposit and its potential to provide additional mill feed for the Rosebery Mine through small resources previously identified, including Langdon's Mine and Cutty-Sark prospects. MMG Exploration intends to continue deep exploration diamond drilling, geophysical surveys and geologic mapping to resolve old and new geologic interpretations.

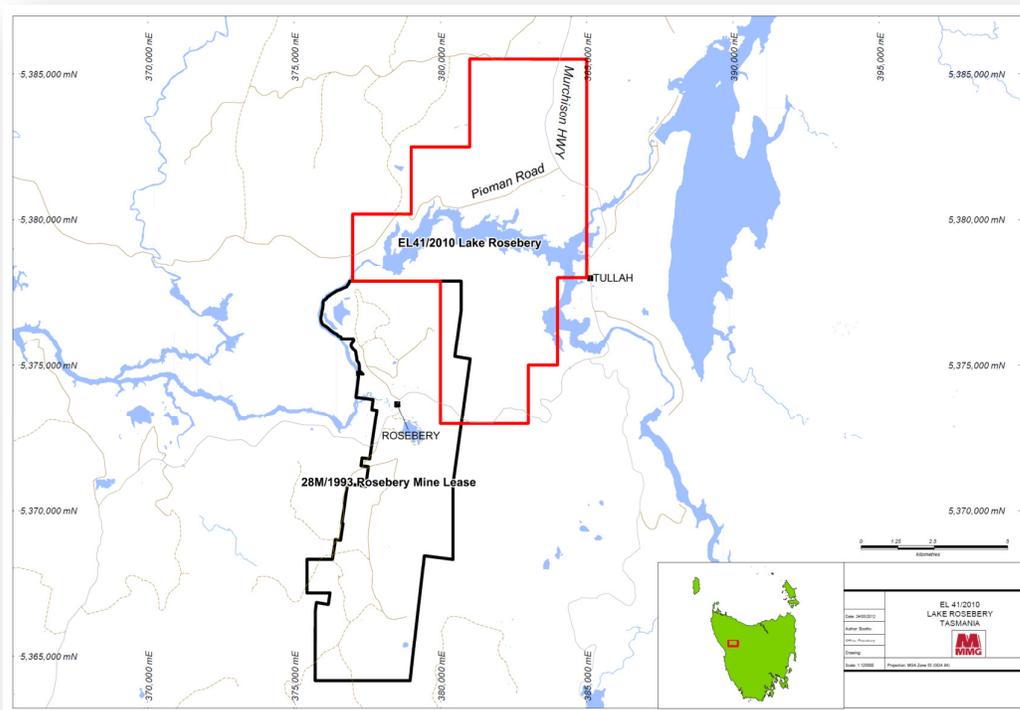


Figure 1. Location of EL41/2010 Lake Rosebery

### 3. LAND TENURE

EL 41/2010 Lake Rosebery (58 sq. km- Figure 2) was granted to MMG Exploration Pty. Ltd. in 2011 for a period of 5 years. EL 41/2010 covers ground relinquished by Bass Metals Ltd (EL 54/2004) previously. MMG hold two additional licenses surrounding EL 41/2010 including Mt Kershaw (EL48/2004) to the North-West and Rosebery Mine lease to the South-East.

Land covered by EL 41/2010 is crown land designated as State Forest or informal reserves including parts of the Boco Creek and Mackintosh Forest Reserve areas. A small section of the Murchison Regional Reserve lies in the South of the tenement. All of the area contained within the tenement boundary is available for exploration under the Mineral Resources Development Act, 1995.

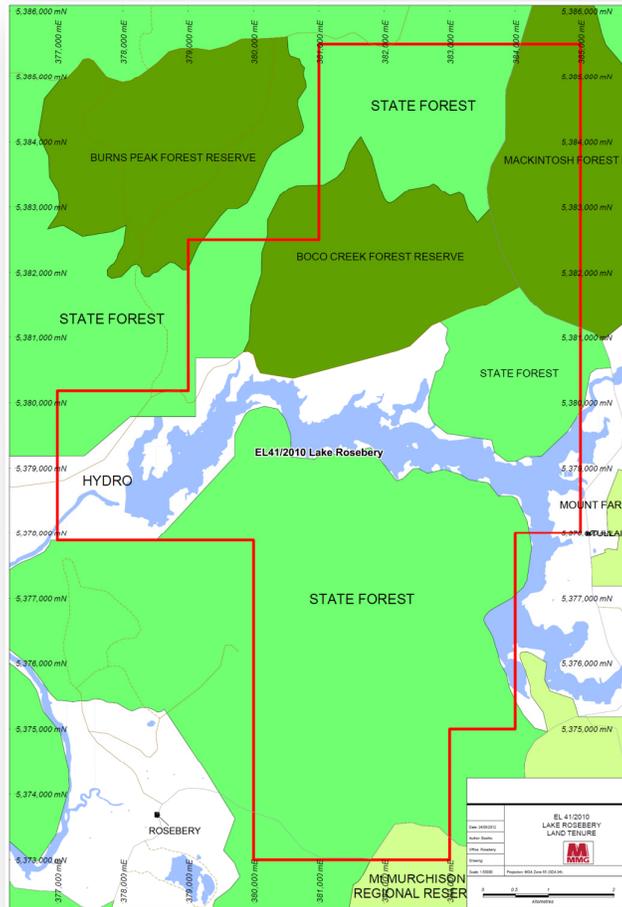


Figure 2. Land Tenure EL41/2010 Lake Rosebery

## 4. GEOLOGY

### Regional

The basement lithologies in western Tasmania are Precambrian in age, comprising predominantly greenschist-facies meta-sediments with minor basalt and dolerite. Higher-grade amphibolite and eclogite facies are also present as isolated occurrences within the Precambrian packages.

Cambrian volcanism and sedimentation developed on this Precambrian continental crust, and is subdivided into the Eo-Cambrian tholeiitic Crimson Creek Formation (CCF) and the mid- to late-Cambrian predominantly calc-alkaline, Mt Read Volcanics (MRV).

The CCF was deposited in shallow but rapidly subsiding basins (Brown, 1986). The CCF consists of basaltic lavas and volcanoclastics, turbidites, carbonates, chert and minor evaporites.

Ultramafic cumulates and volcanic equivalents were thrust onto the CCF in the mid Cambrian (Crawford and Berry 1992). These rocks generate strong magnetic anomalies and outcrop within the Huskisson Syncline.

The MRV form a 200km long by 20km wide broadly north-south trending belt adjacent to and in some areas on-lapping with and intruding Precambrian basement rocks. The volcanics include intermediate to felsic lavas, sub-volcanic porphyries and granites, volcanoclastics and basement-derived sedimentary rocks. The MRV host six economically significant volcanic hosted massive sulphide deposits. Regional structures that subdivide the MRV are the Rosebery and Henty Faults.

The Mt Kershaw license is located at a regionally significant point within the central part of the MRV, where the main trend changes from north-south to northeast-southwest. The area also coincides with a regional lithological change where lithologies correlated with the Rosebery-Hercules sequence are juxtaposed with lithologies broadly correlated to the Sock Creek and Que-Hellyer sequences.

The MRV are overlain by a late Cambrian – early Ordovician marine and fluvial sequence of quartzwacke, polymict sandstones, siltstones, shales and polymict conglomerates (Rosebery Group/Stitt Quartzite to the west of the MRV and Owen Group to the east; Corbett, 2002).

Cambrian volcanism and sedimentation was followed by predominantly basement derived Ordovician to Devonian age sedimentation, which includes sandstone and limestone.

At least two phases of regional compression were associated with the mid-Devonian Tabberabberan Orogeny (Keele, 1991). The development of folding, cleavage and regional thrusts in lower Palaeozoic rocks were associated with this event.

Deformation was followed by the extensive intrusion of Devonian to Carboniferous granitoids. The carbonate replacement and skarn Sn mineralisation at Renison Bell Mount Bischoff and Mt Lindsay, the Pb Zn Ag vein deposits of Zeehan and, possibly, the Tullah Fields are associated with the Devonian granites.

In the Quaternary extensive unconsolidated glacial and fluvioglacial deposits up to >100m thick accumulated (Augustinius and Nichol, 1999). These deposits now obscure parts of the Palaeozoic geology.

## **Local Geology**

The Lake Rosebery licence occurs along strike to the north from the Rosebery deposit and is mapped as containing the northern continuation of the Rosebery stratigraphy. The Central Volcanic Complex (CVC) is host to this deposit and is subdivided into four units: the footwall pyroclastics, the host rocks, the hangingwall epiclastics and the upper lava-rich sequence (Mt Black Volcanics). Major N-S trending fault zones including the Rosebery Fault, Mt Black Fault and Henty Fault, cut the MRV in the licence area.

### *Central Volcanic Complex*

The CVC is dominated by proximal volcanic rocks (rhyolite and dacite flows, domes and cryptodomes and massive pumice breccias) and andesite and rare basalt (lavas, hyaloclastites and intrusive rocks) deposited in a shallow marine environment (Seymour et al., 2006).

### *The Footwall Pyroclastics*

The Footwall Pyroclastics consists of a uniform sequence of feldspar porphyritic, vitric crystal lapilli tuffs which lie below the ore horizon at both the Rosebery and Hercules deposits (Smith & Huston, 1992).

### *The Host Rocks*

Units at Rosebery and Hercules consists predominantly of sericitic siltstone with minor crystal tuffs, bedded carbonates and up to 60m of pyritic black shale. The host rocks and black shale represent a period of quiet sedimentation.

### *The Hangingwall Epiclastics*

This unit disconformably overlies base metal mineralisation and the black shale of the host rock unit. It consists of small to large graded mass flow units which contain polymict lithics including black shale, sandstone and basalt clasts

### *The Mt Black Volcanics*

Overlain by the Mt Black thrust fault, the Mt Black Volcanics predominantly consist of massive to brecciated lavas of dacitic to andesitic composition with volcanoclastic units throughout.

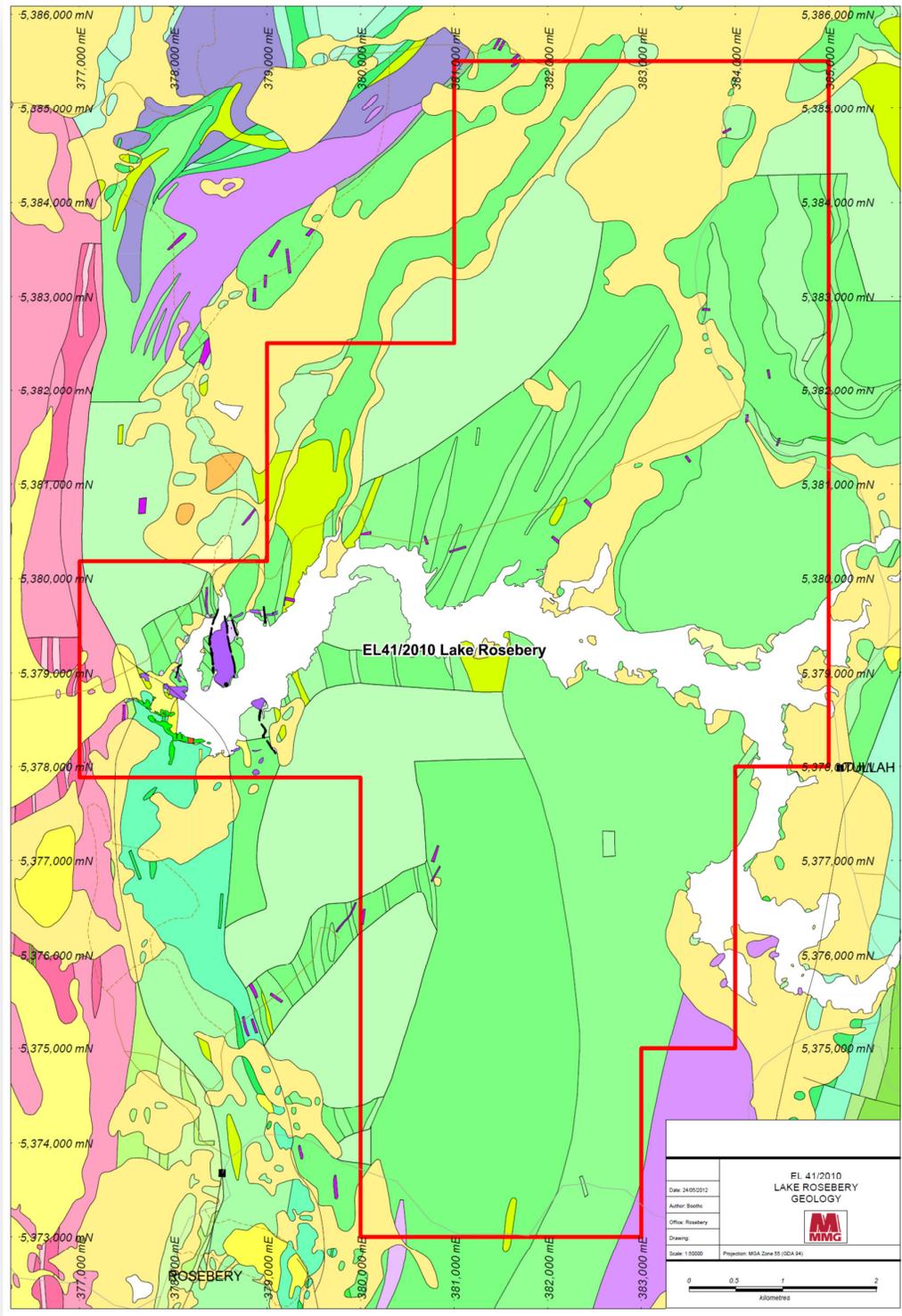


Figure 3. Geology of EL41/2010 Lake Rosebery (Legend in Appendix 1)

## 5. CURRENT EXPLORATION

### Work Completed in the 2013-2014 Period

#### SUMMARY

No field work was completed on the lease during the period as the focus was to test the Rosebery-Marion oak host horizon along strike to the south by drilling from underground on the mine lease. Three holes were drilled which have been interpreted to have successfully intercepted the new host horizon. Unfortunately no significant mineralisation was found.

#### ROCK CHARACTERISATION

During the last period, gathering of litho geochemistry and SWIR data has been a priority. However, all the holes analysed for this project within EL41-2010 were completed during the previous reporting period. The geochemistry was submitted with the 2013 report but the SWIR spectra was not, as it has not been fully interpreted and will be submitted with this report.

Figure 4 shows the sericite compositions of all the data over the Rosebery ore body. Red indicates a wavelength  $<2200\text{nm}$ , this suggests that high acid fluids have reacted with the rock. There is a large anomalous area below the Rosebery fault which has a "typical" VHMS type signature. This anomaly increases to the south and will be a continued focus. It also shows the contact between the high Th Rhyolite breccia unit and the mineralised horizon (red surface) The acid alteration cell is located on the eastern side of the rhyolite contact which may indicate the thick Rhyolite breccia is in the hanging-wall of the mineralisation.

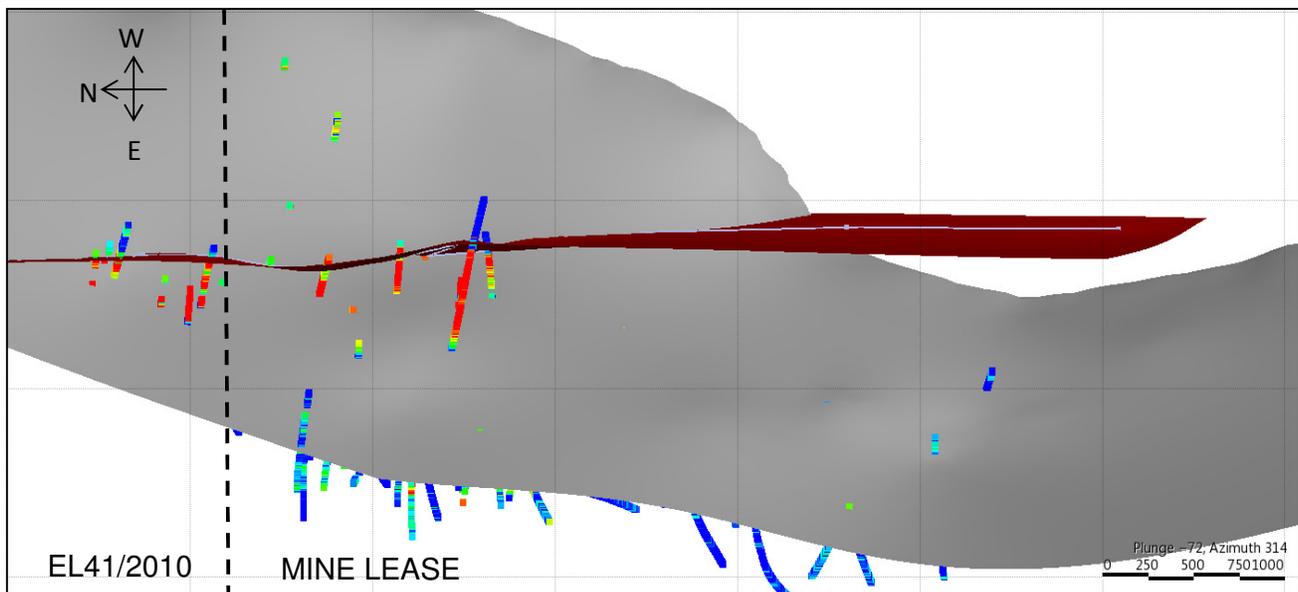


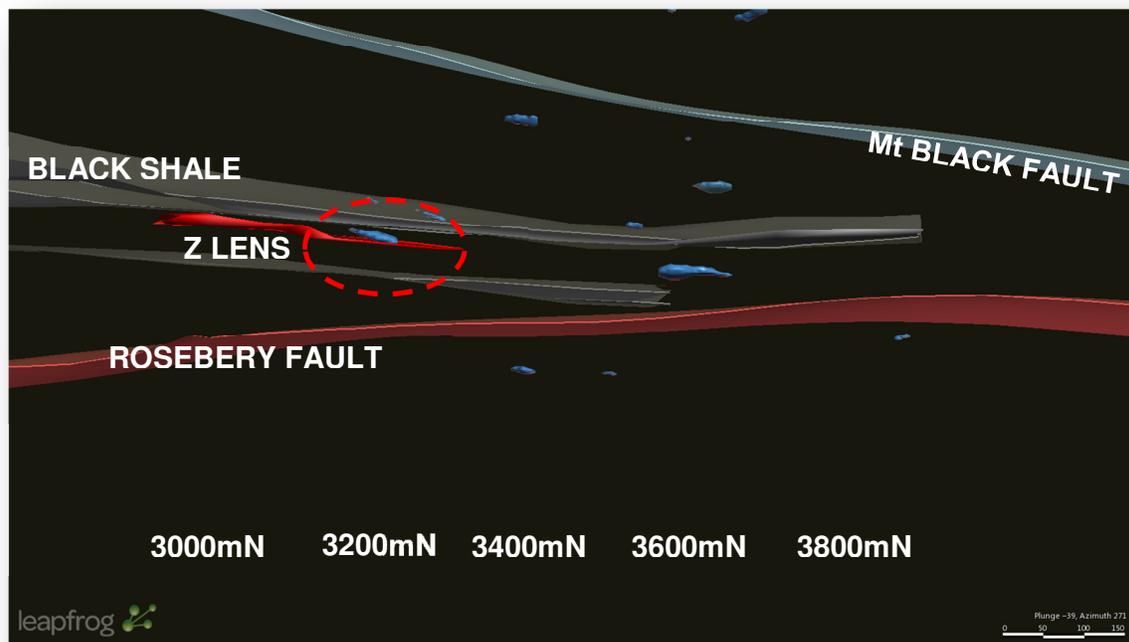
Figure 4. Red indicates a wavelength  $<2200\text{nm}$ ,

### 3D SEISMIC

The high amplitude reflectors were discussed during the peer review in June 2013. It was determined that these anomalies were not suitable for testing due to a number of factors including, size, depth and data integrity (i.e. no VSP was completed). Given this, one of the anomalies lies within two northings 3000mN and 3200mN hosting the position of Z lens (Figure 5). This hole maybe considered to potentially upgrading the lens. However, at this stage there are no plans for this in the coming year.

The MMG 3D Seismic Report was completed and will be submitted with this report. The final conclusions and recommendations are summarized below:

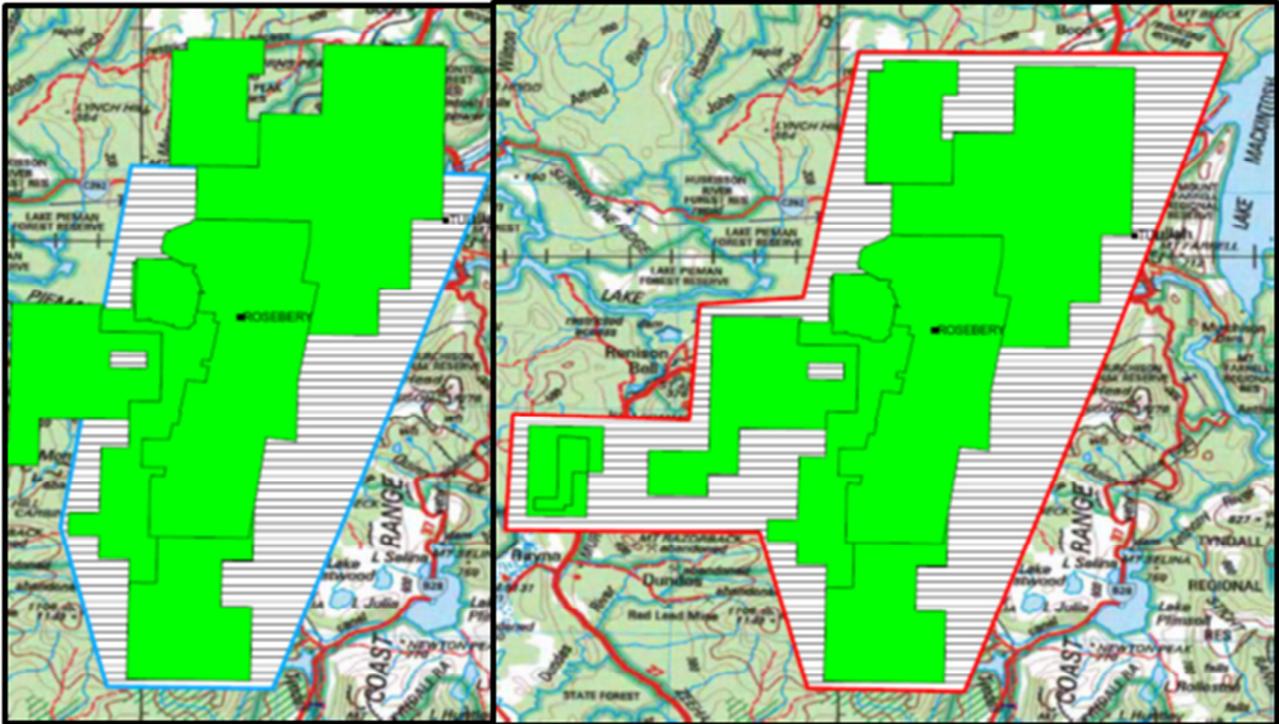
- A Vertical Seismic Profile (VSP) should always be completed.
- If the survey were to be repeated MMG would do the preparation work themselves as the standby costs were significant.
- With the exception of direct sulphide detection, the survey achieved its aims.
- Future surveys by MMG would come at greatly reduced cost for superior results due simply to an increased understanding by the company.



*Figure 5. Red circle indicates high velocity anomaly within Z lens*

## REMOTE SENSING AND PHOTOGRAPHY

Aerial photographs and LIDAR data was gathered in January. LIDAR only covered the southern portion of EL41\_2010. Extra data was captured surrounding the leases for environmental noise modelling. (Figure 6)



*Figure 6. Red indicates area photographed and Blue indicates LIDAR*

## ACADEMIA

In 2013 a UTAS honours thesis was initiated. The aim of this study was to look at the previous studies by Luke Williams 2010 and Craig Winters 2012 which focused on stratigraphic correlations to try and potentially identify structural frameworks to understand the stratigraphic repetition we see in the area. This thesis is yet to be submitted.

## 6. PREVIOUS EXPLORATION

**Date:** 2011-

**Company:** MMG Ltd

**Exploration Philosophy:** Targeting base metal deposits.

**Work Completed:** Diamond drill holes testing along strike of the Rosebery deposit, 3D seismic Survey, SWIR on drill holes, Litho geochem study. LIDAR 2010 and 2014,

**Results and Conclusions:** 9.8m of massive sulphide intersected below the Rosebery Fault

**Report:** Booth and McGilvray 2012, Booth and Denwer 2013.

**Date:** 2005- 2010

**Company:** Bass Metals Ltd

**Exploration Philosophy:** Targeting base metal deposits.

**Work Completed:** Review of ASTER data, 3d modelling, Rock chip sampling, Soil Sampling, MMI, Drill hole planning

**Results and Conclusions:** ASTER data failed to identify anomalous areas. Rock Chip and soil samplings identified some anomalies but were not followed up conclusively. Planned drill hole never drilled.

**Report:** Bates 2010, 2009, 2007. Turnbull and Bates 2006. Jones 2005.

**Date:** 1987- 2000

**Company:** Pasminco Exploration

**Exploration Philosophy:** Targeting base metal deposits.

**Work Completed:** Auger soil sampling, geological mapping, downhole geophysics, surface geophysics & diamond drilling.

**Results and Conclusions:** Low grade Zn intersected at Chester and alteration zone interpreted to extend SW from Chester Mine. Results from Pinnacles, Burns Peak and Farrell included. Lots of data presented and numerous anomalies defined.

**Report:** Lorrigan, 1990. Kirsner, 1992. Fitzgerald, 1993. Parfrey & McNeill, 2000.

**Date:** 1988- 1989

**Company:** Climax Mining Ltd

**Exploration Philosophy:** Targeting base metal deposits.

**Work Completed:** Auger soil sampling, minor ground magnetics & four diamond drill holes (MBD1-MBD4) to test Billiton UTEM anomalies.

**Results and Conclusions:** No significant mineralisation intersected but continued exploration around Cutty Sark recommended.

**Report:** Hine & Scott, 1989.

**Date:** 1988

**Company:** Aberfoyle Resources Ltd

**Exploration Philosophy:** Targeting VHMS deposits

**Work Completed:** Diamond drilling of hole M02 to test a deep CSAMT and UTEM conductor.

**Results and Conclusions:** No significant results.

**Report:** McNeill & Wallace, 1988.

**Date:** 1986

**Company:** Billiton Australia

**Exploration Philosophy:** Targeting base metal deposits.

**Work Completed:** Geological mapping, ground geophysics, rock chip sampling & auger soil geochemistry. Work at Langdons and Cutty Sark and Mt Black.

**Results and Conclusions:** Auger Pb-Zn anomalies defined at Langdons.

**Report:** Randell, J.P., Purvis, J.G. & Hungerford, N., 1986.

**Date:** 1972-1975

**Company:** Electrolytic Zinc Company of Australasia Ltd

**Exploration Philosophy:** Targeting VHMS deposits and exploring Rosebery & Hercules mine trends.

**Work Completed:** Licence along strike both north and south from the Rosebery mine. Geochemistry, geophysics, geological mapping & diamond drilling.

**Results and Conclusions:** Concluded that the mine stratigraphy continues several kilometres north and south of Rosebery.

**Report:** Reinhardt, 1972. Williams, 1975.

## **7. ENVIRONMENTAL**

There was no environmental or rehabilitation activities conducted on EL 41/2010 during this reporting period.

## **8. CONCLUSIONS AND RECOMMENDATIONS**

Further work need to be completed on the 3D mine district model to determining the architecture within the Marionoak zone.

Test surface geochemistry to see if we can replicate the patterns we see from drill core sampling in weathered rock chip and soil samples.

## 9. EXPENDITURE

Total expenditure from 1<sup>st</sup> June 2013 until 2<sup>nd</sup> May 2014 is outlined below

<b>TOTAL COSTS</b>	<b>323,436</b>
<b>PERSONNEL</b>	171,189
<b>CONTRACT FIELD SUPPORT</b>	24,126
<b>GEOSCIENCE CONSULTANTS</b>	
<b>TRACK CUTTING &amp; GRIDDING</b>	
<b>GEOCHEMICAL &amp; ASSAYING</b>	-32764
<b>DRILLING</b>	56053
<b>GEOPHYSICS</b>	50000
<b>STORES &amp; SUPPLIES</b>	22,101
<b>VEHICLES, PLANT &amp; MAINTENANCE</b>	
<b>LAND &amp; ENVIRONMENT</b>	10,886
<b>EQUIPMENT HIRE</b>	
<b>DEPRECIATION, OFFICE &amp; SUNDRY</b>	21,844

*Table 1: Expenditure*

Work programme for the 2014-15 period will include detailed assessment Rosebery-Marionoak. Further geochemical work will also be a priority. Expenditure for the tenement will be a minimum of \$40,000

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