



ABN 23 004 074 962

MMG Limited  
Level 23, 28 Freshwater Place,  
Southbank Victoria 3006  
Australia Telephone: +61 3 9288 0888  
Facsimile: +61 3 9288 0800  
www.mmg.com

# MMG AUSTRALIA LIMITED

ABN 23 004 074 962

**MELBA FLATS, TAS:  
EL43/1992**

## **ANNUAL EXPLORATION REPORT (Reporting Period 15<sup>th</sup> March 2015 to 16<sup>th</sup> March 2016)**

Grant Date: 17 May 1993  
Expiry Date: 16 April 2016

Authority Holder: Allegiance Mining Pty Ltd  
Project Operator: MMG Australia Limited

### **Distribution**

1. MMG Australia Limited
2. Tasmanian Regional Exploration Office Library
3. Mineral Resources Tasmania, Hobart

**Report No : MMR6724**

**Authors** : D Wallace  
B Pietrass-Wong

**Date** : 2 May 2016

### **Author contact details and verification signature:**

David Wallace: David.Wallace@mmg.com  
Tel: 0409 116 450

### **Keywords**

---

EL43/1992, Melba Flats,

---

**SUMMARY**

---

This annual report covers exploration completed on the “Melba Flats” Tenement (EL43/1992) for the year ending 16th March 2016. Melba Flats is a 6km<sup>2</sup> Exploration Licence surrounding the former mining lease ML2/2007, now RL02/2009 with an area of 3km<sup>2</sup>. These licences were acquired to facilitate the development of identified resources at Melba Flats. Minerals and Metals Group Limited (MMG) is the operator of both licences which are held by Allegiance Mining Pty Ltd (Allegiance).

ML2/2007 was granted on 22 August 2007 for a 10 year period. Due to the prevailing economic conditions in 2009 and the current size of the resource at Melba Flats, MMG gained approval in 2009 for the conversion of the ML into a Retention Licence; RL5/2009.

Allegiance was exploring and evaluating the Melba Flats area from 1997, prior to its takeover by Zinifex in 2008 (and the subsequent Zinifex/Oxiana transaction that resulted in the formation of OZ Minerals in 2008). From 1993 to 1997, Rio Tinto Exploration (CRA Exploration) explored the area.

This tenement was exempt from conditions for the period as approved by the Director of mines and subsequently no exploration was completed.

## TABLE OF CONTENTS

---

<b>SUMMARY .....</b>	<b>ii</b>
<b>1 INTRODUCTION .....</b>	<b>1</b>
1.1 LOCATION AND ACCESS	1
1.2 REGIONAL GEOLOGY	1
1.3 LOCAL GEOLOGY AND MINERALISATION	1
1.4 TENEMENT HISTORY	2
<b>2 EXPLORATION COMPLETED DURING THE REPORTING PERIOD .....</b>	<b>3</b>
2.1 MASTERS PROJECT	3
2.2 PROPOSED EXPLORATION IN NEXT REPORTING PERIOD	4
<b>3 ENVIRONMENT .....</b>	<b>4</b>
<b>4 EXPENDITURE STATEMENT .....</b>	<b>4</b>
<b>5 REFERENCES .....</b>	<b>4</b>

## LIST OF TABLES

---

<b>Table 1. Current Exploration Activity and Expenditure for Melba Flats, EL43/1992. ....</b>	<b>4</b>
---	----------

## LIST OF FIGURES

---

Figure 1. Location of the Melba Flats Tenement, EL43/1992.  
 Figure 2. MRT geology with tenement locations (1:25,000).

## LIST OF DIGITAL FILES

---

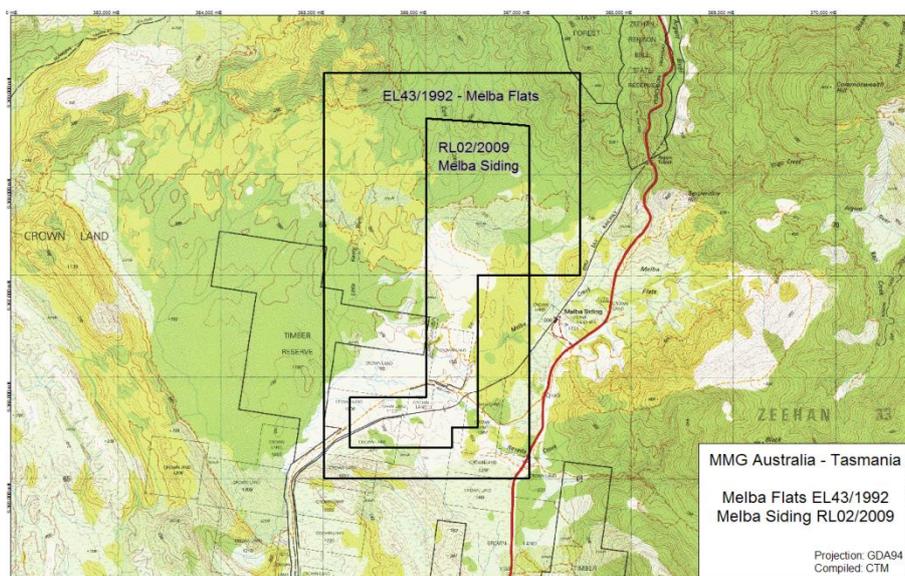
EL43-1992 Melba Flats An Rpt 2016.doc

## 1 INTRODUCTION

This annual report covers exploration completed on the “Melba Flats” Tenement EL43/1992, for the year ending 16th March 2016. The Melba Flats EL surrounds the former mining lease ML2/2007, now RL02/2009. These areas were acquired to facilitate the development of identified resources at Melba Flats. Minerals and Metals Group Limited (MMG) is the operator of both licences, which are held by Allegiance Mining Pty Ltd (Allegiance). No exploration was completed due to an exemption of conditions granted by the Director of Mines.

### 1.1 LOCATION AND ACCESS

The Melba Flats Tenement is located ~17km WSW of Rosebery Township and ~9km NE of Zeehan Township in Western Tasmania (**Figure 1**). Access to the project area is from the Murchison Highway via tracks established by Forestry Tasmania roads.



**Figure 1: EL43/1992 location on 1:25K topographic map**

### 1.2 REGIONAL GEOLOGY

The Melba Flats area consists of Cambrian Crimson Creek Formation sediments intruded by a number of gabbro dykes of unknown age. The dykes are considered genetically associated with the Serpentine Hill and Razorback Ultramafic bodies east of the area of interest. It is possible the dykes are alternatively associated with the Henty Dyke Swarm. Turbiditic sediments dip to the east and generally strike north-south. District folding and common small-scale faulting commonly cause local variations to this trend.

The gabbro dykes are intrusive, often with chilled, brecciated margins, and are both concordant and discordant to sediments. The dykes, proximal sediments and ultramafics are pervasively carbonate and carbonate-talc altered with ubiquitous late stage carbonate veining.

### 1.3 LOCAL GEOLOGY AND MINERALISATION

The Melba Flats Ni-Cu mineralisation is typically disseminated throughout the gabbro dyke host rock, and more concentrated on footwall contact positions. Mineralisation is principally pentlandite-millerite-chalcocopyrite-pyrite. Significant cobalt, gold and PGE's are associated with either (or both) nickel and copper sulphides. Late-stage carbonate alteration and veining is also accompanied by coarse galena-sphalerite-chalcocopyrite occurrences. The body of existing petrologic data suggests the Melba Flats sulphides are hydrothermal replacement deposits, derived from a larger magmatic source.



of 30 June 2015.

Since then multiple parties have expressed their interest in the assets. MMG is still in active discussion with several parties interested in acquiring the assets and is continuing to facilitate site visits and information sharing.

## **2 EXPLORATION COMPLETED DURING THE REPORTING PERIOD**

---

There was minimal exploration completed during the period due to the exemption from conditions. A Masters project was completed (see below).

### **2.1 MASTERS PROJECT**

---

On 3<sup>rd</sup> March 2014, a Masters Project conducted by Marcus Phia from Melbourne University commenced, and was completed in late 2015. The project was entitled the "Petrogenesis of the gabbroic sills hosting magmatic Ni-Cu-PGE sulphides at Melba Flats". An electronic copy of this thesis has been submitted to MRT.

#### ***Aims***

---

The aims of the project were to establish the tectonic setting, magmatic affiliations and age of the Ni-Cu-PGE sulphide hosting gabbroic sills. The research included diamond drill core logging, petrographic investigations and whole rock geochemical studies. The ages of the sills were established using U-Pb dating of accessory minerals such as zircon, baddeleyite and rutile.

Other outcomes of the research were to provide:

- A structural study of sill orientations with the aim of producing a 3D model of the sills.
- Whole rock geochemistry of the sills to determine if there are compositional differences between the barren and mineralised host rocks. Previous geochemical data and the examination of Melba Flats drill core indicates the mineralised rocks are more primitive than the non-mineralised rocks.
- Whole rock geochemical analyses together with PGE, Cu, Ni, S and Se on samples from the gabbroic sill intersected in A254 which lies below and appears to intrude the Avebury serpentinite. Sections of the sill carry magmatic Ni-Cu sulphides and a xenolith.

#### ***Outcomes/Conclusions***

---

Preliminary investigations suggest that the host rocks at Avebury and Melba Flats are the same age and are potentially similarly aged deposits. This is in contrast to current geological maps which show the Melba Flats deposits to be hosted in Rosebery Group sediments and Avebury in Crimson Creek sediments.

The ore-grade Ni-Cu-PGE sulphides at Melba Flats were formed at depth due to interaction of a PGE-undepleted high MgO magma with S-bearing crustal rocks. Some of these sulphides were then picked up as liquid sulphide droplets and transported by later batches of the same magma type. During transport, some of the sulphides were resorbed by the sulphide-undersaturated magma. As a result some of the Fe and the S in the sulphides were taken back into the magma, leaving residual sulphides that were enriched in Cu, Ni, PGE and Se.

As it is highly probable that only a small proportion of the Ni-Cu-PGE sulphides formed at depth were transported to their current sites, there is considerable potential for significant amounts of additional sulphides at depth. If present, these sulphides would have somewhat lower tenors than the Melba Flats high grade sulphides. However, the tenors of these sulphides are likely to be quite economically attractive as the tenors of the Melba Flats sulphides (~10% Ni and ~5% Cu) are significantly higher than many Ni-Cu sulphide deposits.

## 2.2 PROPOSED EXPLORATION IN NEXT REPORTING PERIOD

---

During the next reporting period it is proposed to review the results from the master's thesis by Phia which suggests significant nickel sulphide at depth. The geophysical response of this sulfide style will be assessed and an appropriate survey designed and implemented.

An exploration expenditure of \$20,000 is proposed.

## 3 ENVIRONMENT

---

No rehabilitation work was required during the period.

## 4 EXPENDITURE STATEMENT

---

For the current reporting period, a total of \$3,904 was spent on the Melba Flats tenement. A breakdown of expenditure costs for the project is given in **Table 2**.

Exploration Category	Description of Activity	Expenditure
Personnel	Research Project	\$ 3,904.00
	<b>Total costs</b>	<b>\$ 3,904.00</b>

**Table 1.** Current Exploration Activity and Expenditure for Melba Flats, EL43/1992.

## 5 REFERENCES

---

Denwer, K., 2015. Annual report for Melba Flats, EL43/1992, ending 16<sup>th</sup> March 2015. *MMG Australia Limited*.