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MMG LIMITED

五礦資源有限公司

(Incorporated in Hong Kong with limited liability)

(HKEX STOCK CODE: 1208)
(ASX STOCK CODE: MMG)

MINERAL RESOURCES AND ORE RESERVES STATEMENT AS AT 30 JUNE 2019

This announcement is made by MMG Limited (Company or MMG and, together with its subsidiaries, the Group) pursuant to rule 13.09(2) of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (Listing Rules) and the Inside Information Provisions (as defined in the Listing Rules) under Part XIVA of the Securities and Futures Ordinance (Chapter 571 of the Laws of Hong Kong).

The board of directors of the Company (Board) is pleased to report the Group's updated Mineral Resources and Ore Reserves Statement as at 30 June 2019 (Mineral Resources and Ore Reserves Statement).

The key changes to Mineral Resources and Ore Reserves Statement as at 30 June 2019 are:

- The Group's Mineral Resources (contained metal) have increased for zinc (4%) and decreased for copper (1%), lead (6%), silver (7%), gold (6%) and molybdenum (8%).
- The Group's Ore Reserves (contained metal) have increased for molybdenum (2%) and decreased for copper (7%), zinc (15%), lead (23%), silver (13%) and gold (9%).
- Cobalt has been reported for the first time in Mineral Resources and now includes 48kt cobalt from Kinsevere and 4kt from the regional deposits.

For copper metal, the main reasons for the changes are depletion, cost increases and pit design at Kinsevere which were partially offset by increased metal price. For zinc metal, the main reasons for the changes are depletion at all sites and changes in the mine design at Dugald River deposit.

All data reported here are on a 100% asset basis, with MMG's attributable interest shown against each asset within the Mineral Resources and Ore Reserves tables (pages 4 to 7).

MMG Limited

MINERAL RESOURCES AND ORE RESERVES STATEMENT

30 June 2019

MINERAL RESOURCES AND ORE RESERVES STATEMENT

A copy of the executive summary of the Mineral Resources and Ore Reserves Statement is annexed to this announcement.

The information referred to in this announcement has been extracted from the report titled Mineral Resources and Ore Reserves Statement as at 30 June 2019 published on 22 October 2019 and is available to view on www.mmg.com. The Company confirms that it is not aware of any new information or data that materially affects the information included in the Mineral Resources and Ore Reserves Statement and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the Mineral Resources and Ore Reserves Statement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the Mineral Resources and Ore Reserves Statement.

By order of the Board
MMG Limited
Gao Xiaoyu
CEO and Executive Director

Hong Kong, 22 October 2019

As at the date of this announcement, the Board comprises nine directors, of which two are executive directors, namely Mr Gao Xiaoyu and Mr Xu Jiqing; three are non-executive directors, namely Mr Guo Wenqing (Chairman), Mr Jiao Jian and Mr Zhang Shuqiang; and four are independent non-executive directors, namely Dr Peter William Cassidy, Mr Leung Cheuk Yan, Ms Jennifer Anne Seabrook and Professor Pei Ker Wei.

MMG Limited

MINERAL RESOURCES AND ORE RESERVES STATEMENT

30 June 2019

EXECUTIVE SUMMARY

Mineral Resources and Ore Reserves for MMG have been estimated as at 30 June 2019 and are reported in accordance with the guidelines in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (2012 JORC Code) and Chapter 18 of the Listing Rules. Mineral Resources and Ore Reserves tables are provided on pages 4 to 7, which include the 30 June 2019 and 30 June 2018 estimates for comparison. The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources that convert to Ore Reserves. All supporting data are provided within the Technical Appendix, available on the MMG website.

Mineral Resources and Ore Reserves information in this statement has been compiled by Competent Persons (as defined by the 2012 JORC Code). Each Competent Person consents to the inclusion of the information in this report that they have provided in the form and context in which it appears. Competent Persons are listed on page 8.

MMG has established processes and structures for the governance of Mineral Resources and Ore Reserves estimation and reporting. MMG has a Mineral Resources and Ore Reserves Committee that regularly convenes to assist the MMG Governance and Nomination Committee and the Board of Directors with respect to the reporting practices of the Company in relation to Mineral Resources and Ore Reserves, and the quality and integrity of these reports of the Group.

Key changes to the Mineral Resources (contained metal) since the 30 June 2018 estimate have been mostly related to depletion[1] at all sites together with increased costs and changes to pit design at Kinsevere. An increase in metal price assumptions has partially offset these reductions together with the addition of three satellite copper oxide deposits in the DRC. At Dugald River, a net increase has resulted from Mineral Resource extension in the hangingwall and footwall lenses which has replaced 2018 depletion.

Key changes to the Ore Reserves (contained metal) since the 30 June 2018 estimate have been mostly related to depletion. Ore loss and dilution greater than planned have been offset by gains from higher metal price assumptions. Decreases at Kinsevere are related to unplanned ore loss and dilution as well as to geotechnical challenges which have resulted in increased cut off grades and pit design changes. At Dugald River, changes to pillar design and mining sequence have resulted in lower Ore Reserves.

Las Bambas has been operating for 36 months since commercial production was declared on 1 July 2016. During this time the mine has experienced both positive and negative reconciliation factors compared to the Ore Reserve. Ore loss and dilution factors have been increased for the 2019 Las Bambas Ore Reserve estimates.

Pages 9 and 10 provide further discussion of the Mineral Resources and Ore Reserves changes.

[1] Depletion in this report refers to material processed by the mill and depleted from the Mineral Resources and Ore Reserves through mining.

MMG Limited

MINERAL RESOURCES AND ORE RESERVES STATEMENT

30 June 2019

MINERAL RESOURCES[1]

All data reported here is on a 100% asset basis, with MMG's attributable interest shown against each asset within brackets.

	2019								2018							
Deposit	Tonnes (Mt)	Cu (%)	Zn (%)	Pb (%)	Ag (g/t)	Au (g/t)	Mo (ppm)	Co (%)	Tonnes (Mt)	Cu (%)	Zn (%)	Pb (%)	Ag (g/t)	Au (g/t)	Mo (ppm)	Co (%)
Las Bambas (62.5%)																
Ferrobamba Oxide Copper																
Indicated	2.1	1.7							3.0	1.7						
Inferred	1.3	1.8							1.1	1.9						
Total	**3.4**	**1.7**							**4.1**	**1.7**						
Ferrobamba Primary Copper																
Measured	553	0.56			2.4	0.05	202		546	0.60			2.7	0.05	1099	
Indicated	465	0.58			2.5	0.05	166		426	0.61			3.0	0.05	890	
Inferred	239	0.61			1.3	0.03	79		254	0.63			3.0	0.05	493	
Total	**1,257**	**0.57**			**2.2**	**0.04**	**166**		**1,226**	**0.61**			**2.9**	**0.05**	**2483**	
Ferrobamba Total	**1,261**								**1,230**							
Chalcobamba Oxide Copper																
Indicated	6.5	1.4							6.1	1.5						
Inferred	0.5	1.5							0.7	1.5						
Total	**7.0**	**1.4**							**6.8**	**1.5**						
Chalcobamba Primary Copper																
Measured	113	0.44			1.4	0.02	75		75	0.44			1.4	0.02	189	
Indicated	174	0.63			2.4	0.03	179		179	0.67			2.5	0.03	353	
Inferred	38	0.51			1.8	0.02	33		33	0.54			1.9	0.03	70	
Total	**325**	**0.55**			**2.0**	**0.02**	**287**		**287**	**0.60**			**2.2**	**0.03**	**612**	
Chalcobamba Total	**332**								**293**							
Sulfobamba Primary Copper																
Indicated	98	0.61			4.3	0.02	89		89	0.65			4.6	0.02	187	
Inferred	133	0.50			5.2	0.02	106		106	0.56			6.3	0.02	238	
Total	**230**	**0.55**			**4.8**	**0.02**	**194**		**194**	**0.60**			**5.5**	**0.02**	**425**	
Sulfobamba Total	**230**								**194**							
Oxide Copper Stockpile																
Indicated	11.4	1.2							9.9	1.2						
Total	**11.4**	**1.2**							**9.9**	**1.2**						
Sulphide Stockpile																
Measured	9.0	0.46							2.3	0.41						
Total	**9.0**	**0.46**							**2.3**	**0.41**						
Las Bambas Total	**1,844**								**1,730**							

[1] S.I. units used for metals of value; Cu=copper, Zn=zinc, Pb=lead, Ag=silver, Au=gold, Mo=molybdenum, Co=cobalt.

MINERAL RESOURCES – DRC[1]

	2019								2018							
Deposit	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**	**Co (%)**	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**	**Co (%)**
Kinsevere (100%)																
Oxide Copper																
Measured	1.4	4.2						0.17	2.0	4.3						
Indicated	7.2	3.3						0.08	9.7	3.1						
Inferred	0.9	2.4						0.09	1.8	2.4						
Total	**9.5**	**3.3**						**0.10**	**13.6**	**3.2**						
Transition Mixed Copper Ore																
Measured	0.5	2.5						0.21	1.3	2.9						
Indicated	2.0	2.0						0.14	3.4	2.0						
Inferred	0.3	1.9						0.09	0.4	1.9						
Total	**2.8**	**2.1**						**0.15**	**5.2**	**2.3**						
Primary Copper																
Measured	1.2	2.8						0.28	6.1	2.7						
Indicated	19.5	2.3						0.13	15.8	2.1						
Inferred	2.4	1.9						0.12	2.0	1.7						
Total	**23.2**	**2.3**						**0.14**	**24.0**	**2.2**						
Oxide-TMO Cobalt																
Measured	0.03							0.61								
Indicated	0.3							0.59								
Inferred	0.1							0.56								
Total	**0.4**							**0.58**								
Primary Cobalt																
Measured	0.01							0.33								
Indicated	0.2							0.31								
Inferred	0.1							0.29								
Total	**0.3**							**0.30**								
Stockpiles																
Measured																
Indicated	12.9	1.8							10.2	2.2						
Total	**12.9**	**1.8**							**10.2**	**2.2**						
Kinsevere																
Total	**49.2**								**52.9**							
Sokoroshe II (100%)																
Oxide Copper																
Measured																
Indicated	0.8	3.5						0.28								
Inferred	0.1	1.9						0.11								
Total	**0.9**	**3.3**						**0.26**								
Nambulwa (100%)																
Oxide Copper																
Measured																
Indicated																
Inferred	0.9	2.3						0.11								
Total	**0.9**	**2.3**						**0.11**								
DZ (100%)																
Oxide Copper																
Measured																
Indicated																
Inferred	0.5	1.9						0.16								
Total	**0.5**	**1.9**						**0.16**								

MMG Limited

MINERAL RESOURCES AND ORE RESERVES STATEMENT

30 June 2019

MINERAL RESOURCES[1]

	2019								2018							
Deposit	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**	**Co (%)**	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**	**Co (%)**
Dugald River (100%)																
Primary Zinc																
Measured	12.9		13.1	2.3	69				8.9		12.9	2.3	72			
Indicated	20.9		12.3	1.6	23				24.3		12.6	2.0	30			
Inferred	25.5		11.7	1.2	7				23.5		12.1	1.5	8			
Total	**59.3**		**12.2**	**1.6**	**26**				**56.7**		**12.4**	**1.8**	**27**			
Primary Copper																
Inferred	8.7	1.6				0.2			6.6	1.5				0.2		
Total	**8.7**	**1.6**				**0.2**			**6.6**	**1.5**				**0.2**		
Dugald River Total	**68.0**								**63.3**							
Rosebery (100%)																
Primary Sulphides																
Measured	6.1	0.20	8.3	2.9	109	1.3			6.4	0.21	8.6	2.9	113	1.3		
Indicated	3.1	0.18	7.0	2.4	92	1.3			5.6	0.23	7.6	2.4	91	1.2		
Inferred	7.3	0.33	8.9	3.1	100	1.5			6.0	0.28	7.4	2.8	89	1.4		
Total	**16.6**	**0.26**	**8.3**	**2.9**	**102**	**1.4**			**18.1**	**0.24**	**7.9**	**2.7**	**98**	**1.3**		
Rosebery Total	**16.6**								**18.1**							
High Lake (100%)																
Measured																
Indicated	7.9	3.0	3.5	0.3	83	1.3			7.9	3.0	3.5	0.3	83	1.3		
Inferred	6.0	1.8	4.3	0.4	84	1.3			6.0	1.8	4.3	0.4	84	1.3		
Total	**14.0**	**2.5**	**3.8**	**0.4**	**84**	**1.3**			**14.0**	**2.5**	**3.8**	**0.4**	**84**	**1.3**		
Izok Lake (100%)																
Measured																
Indicated	13.5	2.4	13	1.4	73	0.18			13.5	2.4	13.3	1.4	73	0.18		
Inferred	1.2	1.5	11	1.3	73	0.21			1.2	1.5	10.5	1.3	73	0.21		
Total	**14.6**	**2.3**	**13**	**1.4**	**73**	**0.18**			**14.6**	**2.3**	**13.1**	**1.4**	**73**	**0.18**		

MMG Limited

MINERAL RESOURCES AND ORE RESERVES STATEMENT

30 June 2019

ORE RESERVES[1]

All data reported here is on a 100% asset basis, with MMG's attributable interest shown against each asset within brackets.

Reserves

	2019							2018						
Deposit	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**	**Tonnes (Mt)**	**Cu (%)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**	**Au (g/t)**	**Mo (ppm)**
Las Bambas (62.5%)														
Ferrobamba Primary Copper														
Proved	487	0.59			2.5	0.05	205	504	0.62			3	0.05	197
Probable	295	0.65			2.9	0.06	172	287	0.68			4	0.07	179
Total	**783**	**0.61**			**2.7**	**0.05**	**192**	**791**	**0.64**			**3**	**0.06**	**191**
Chalcobamba Primary Copper														
Proved	73	0.52			1.7	0.02	161	56	0.54			1.8	0.02	144
Probable	122	0.71			2.7	0.03	128	139	0.72			2.7	0.03	135
Total	**195**	**0.64**			**2.4**	**0.03**	**141**	**195**	**0.67**			**2.5**	**0.03**	**137**
Sulfobamba Primary Copper														
Proved														
Probable	69	0.73			5.2	0.03	164	59	0.81			5.9	0.03	161
Total	**69**	**0.73**			**5.2**	**0.03**	**164**	**59**	0.81			**5.9**	0.03	**161**
Primary Copper Stockpiles														
Proved	9.0	0.46			2.3		151	2.30	0.41			1.7		**158**
Total	**9.0**	**0.46**			**2.3**		**151**	**2.30**	**0.41**			**1.7**		**158**
Las Bambas Total	**1,056**							**1,048**						
Kinsevere (100%)														
Oxide Copper														
Proved	1.0	4.2						1.9	4.4					
Probable	4.3	3.2						6.1	3.7					
Total	**5.3**	**3.4**						**8.0**	**3.8**					
Stockpiles														
Proved														
Probable	6.6	1.9						7.7	2.3					
Total	**6.6**	**1.9**						**7.7**	**2.3**					
Kinsevere Total	**11.9**							**15.7**						
Dugald River (100%)														
Primary Zinc														
Proved	11.8		10.9	2.0	57			6.9		11.5	2.1	65		
Probable	14.1		11.1	1.5	18			21.7		11.7	2.0	30		
Total	**25.9**		**11.0**	**1.7**	**36**			**28.6**		**11.7**	**2.0**	**38**		
Dugald River Total	**25.9**							**28.6**						
Rosebery (100%)														
Proved	3.6	0.20	7.4	2.7	107	1.3		3.7	0.21	8.3	3.0	114	1.4	
Probable	1.1	0.20	6.9	2.5	95	1.3		1.7	0.19	7.3	2.9	113	1.4	
Total	**4.7**	**0.20**	**7.3**	**2.7**	**104**	**1.3**		**5.4**	**0.21**	**8.0**	**3.0**	**114**	**1.4**	
Rosebery Total	**4.7**							**5.4**						

[1] S.I. units used for metals of value; Cu=copper, Zn=zinc, Pb=lead, Ag=silver, Au=gold, Mo=molybdenum.

COMPETENT PERSONS

Table 1 – Competent Persons for Mineral Resources, Ore Reserves and Corporate

Deposit	Accountability	Competent Person	Professional Membership	Employer
MMG Mineral Resources and Ore Reserves Committee	Mineral Resources	Rex Berthelsen[1]	HonFAusIMM(CP)	MMG
MMG Mineral Resources and Ore Reserves Committee	Ore Reserves	Neil Colbourne[1]	MAusIMM	MMG
MMG Mineral Resources and Ore Reserves Committee	Metallurgy: Mineral Resources / Ore Reserves	Geoffrey Senior[1]	MAusIMM	MMG
Las Bambas	Mineral Resources	Rex Berthelsen[4]	HonFAusIMM(CP)	MMG
Las Bambas	Ore Reserves	Yao Wu[1]	MAusIMM(CP)	MMG
Las Bambas	Metallurgy: Mineral Resources / Ore Reserves	Amy Lamb[1]	MAusIMM(CP)	MMG
Kinsevere	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG
Kinsevere	Ore Reserves	Dean Basile	MAusIMM(CP)	MMG
Kinsevere	Metallurgy: Mineral Resources / Ore Reserves	Nigel Thiel[1]	MAusIMM(CP)	MMG
Rosebery	Mineral Resources	Douglas Corley[1]	MAusIMM(CP)	MMG
Rosebery	Ore Reserves	Karel Steyn[1]	MAusIMM	MMG
Rosebery	Metallurgy: Mineral Resources / Ore Reserves	Kevin Rees	MAusIMM(CP)	MMG
Dugald River	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG
Dugald River	Ore Reserves	Karel Steyn[1]	MAusIMM	MMG
Dugald River	Metallurgy: Mineral Resources / Ore Reserves	Nigel Thiel[1]	MAusIMM(CP)	MMG
High Lake, Izok Lake	Mineral Resources	Allan Armitage[2]	MAPEG (P.Geo)	Formerly MMG

The information in this report that relates to Mineral Resources and Ore Reserves is based on information compiled by the listed Competent Persons, who are Members or Fellows of the Australasian Institute of Mining and Metallurgy (AusIMM), the Australian Institute of Geoscientists (AIG) or a Recognised Professional Organisation (RPO) and have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as Competent Persons as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Each of the Competent Persons has given consent to the inclusion in the report of the matters based on their information in the form and context in which it appears.

[1] Participants in the MMG Long-Term Incentive Plans which may include Mineral Resources and Ore Reserves growth as a performance condition

[2] Member of the Association of Professional Engineers and Geoscientists of British Columbia

SUMMARY OF SIGNIFICANT CHANGES

MINERAL RESOURCES

Mineral Resources as at 30 June 2019 have changed since the 30 June 2018 estimate for a number of reasons with the most significant changes outlined in this section.

Increases:

- increases to the Mineral Resources (contained metal) for zinc (3%) at Dugald River are due to continued drilling, resulting in additions in the hangingwall and footwall lenses;
- additional copper Mineral Resources (60kt) have been added from MMG's DRC tenements from the deposits of Sokoroshe II, Nambulwa and DZ. Cobalt has been reported for the first time and now includes 48kt cobalt from Kinsevere and 4kt from the regional deposits.

Decreases:

The decreases in Mineral Resources (contained metal) are due to:

- depletion at all producing operations;
- reduction in tonnage at Kinsevere Hill South Inferred Resource after drilling;
- overall reduction in Kinsevere due to a small increase to cut-off grade and changes to pit design parameters resulting from geotechnical assumptions.

ORE RESERVES

Ore Reserves as at 30 June 2019 (contained metal) have decreased for copper (7%), zinc (15%), lead (23%), silver (13%), gold (9%) and increased for molybdenum (2%).

Variations to Ore Reserves (contained metal) on an individual site basis are discussed below:

Increases:

- a net increase in Ore Reserves for molybdenum at Las Bambas due to increased metal price assumptions.

Decreases:

A net reduction in Ore Reserves (metal) for copper, zinc, lead, silver and gold due to:

- depletion at all producing operations;
- a further reduction at Las Bambas due to increase in ore loss assumption;
- a further reduction at Kinsevere due to changes in ore loss assumption, pit design from changed geotechnical assumptions and reductions in uneconomic stockpiles. Increase in copper price assumption did not offset the above;
- a further reduction at Dugald River due to changed pillar design and mining sequence;
- at Rosebery, metal price increases had negligible impact on the overall outcome compared to depletion.

KEY ASSUMPTIONS

PRICES AND EXCHANGE RATES

The following price and foreign exchange assumptions, set according to the relevant MMG Standard as at January 2019, have been applied to all Mineral Resources and Ore Reserves estimates. Price assumptions for all metals have changed from the 2018 Mineral Resources and Ore Reserves statement.

Table 2 : 2019 Price (real) and foreign exchange assumptions

<table>
<tr><th></th><th>Ore Reserves</th><th>Mineral Resources</th></tr>
<tr><td>Cu (US$/lb)</td><td>3.18</td><td>3.64</td></tr>
<tr><td>Zn (US$/lb)</td><td>1.22</td><td>1.46</td></tr>
<tr><td>Pb (US$/lb)</td><td>0.90</td><td>1.08</td></tr>
<tr><td>Au US$/oz</td><td>1252</td><td>1461</td></tr>
<tr><td>Ag US$/oz</td><td>16.66</td><td>19.19</td></tr>
<tr><td>Mo (US$/lb)</td><td>8.58</td><td>9.81</td></tr>
<tr><td>Co (US$/lb)</td><td>23.23</td><td>30.19</td></tr>
<tr><td>USD:CAD</td><td>1.30</td><td rowspan="3">As per Ore Reserves</td></tr>
<tr><td>AUD:USD</td><td>0.78</td></tr>
<tr><td>USD:PEN</td><td>3.20</td></tr>
</table>

CUT-OFF GRADES

Mineral Resources and Ore Reserves cut-off values are shown in Table 3 and Table 4 respectively.

Table 3 : Mineral Resources cut-off grades

Site	Mineralisation	Likely Mining Method[1]	Cut-Off Value	Comments
Las Bambas	Oxide Copper	OP	1% Cu	Cut-off is applied as a range that varies for each deposit and mineralised rock type at Las Bambas. *In-situ* copper Mineral Resources constrained within US\$3.64/lb Cu pit shell.
	Primary Copper	OP	0.14 – 0.22% Cu	
Kinsevere	Oxide Copper & Stockpiles	OP	0.6% CuAS[2]	*In-situ* copper Mineral Resources constrained within a US\$3.64/lb Cu pit shell.
	Transition Mixed Copper	OP	0.7% Cu[3]	
	Primary Copper	OP	0.8% Cu[3]	
	Oxide TMO Cobalt	OP	0.4% Co[7]	*In-situ* cobalt Mineral Resources constrained within a US\$3.64/lb Cu pit shell, but exclusive of copper mineralisation.
	Primary Cobalt	OP	0.2% Co[7]	*In-situ* cobalt Mineral Resources constrained within a US\$3.64/lb Cu pit shell, but exclusive of copper mineralisation.
Sokoroshe II	Oxide Copper	OP	1.1% CuAS[2]	*In-situ* copper Mineral Resources constrained within a US\$3.64/lb Cu pit shell.
Nambulwa / DZ	Oxide Copper	OP	0.9% CuAS[2]	*In-situ* copper Mineral Resources constrained within a US\$3.64/lb Cu pit shell.
Rosebery	Rosebery (Zn, Cu, Pb, Au, Ag)	UG	A\$165/t NSR[4]	Remnant upper mine areas A\$165/t NSR[4]
Dugald River	Primary Zinc (Zn, Pb, Ag)	UG	A\$138/t NSR[4]	
	Primary Copper	UG	1% Cu	
High Lake	Cu, Zn, Pb, Ag, Au	OP	2.0% CuEq[5]	CuEq[5] = Cu + (Zn×0.30) + (Pb×0.33) + (Au×0.56) + (Ag×0.01): based on Long-Term prices and metal recoveries at Au:75%, Ag:83%, Cu:89%, Pb:81% and Zn:93%.
High Lake	Cu, Zn, Pb, Ag, Au	UG	4.0% CuEq[5]	CuEq[5] = Cu + (Zn×0.30) + (Pb×0.33) + (Au×0.56) + (Ag×0.01): based on Long-Term prices and metal recoveries at Au:75%, Ag:83%, Cu:89%, Pb:81% and Zn:93%.
Izok Lake	Cu, Zn, Pb, Ag, Au	OP	4.0% ZnEq[6]	ZnEq[6] = Zn + (Cu×3.31) + (Pb×1.09) + (Au×1.87) + (Ag×0.033); prices and metal recoveries as per High Lake.

[1] OP = Open Pit, UG = Underground
[2] CuAS = Acid Soluble Copper
[3] Cu = Total Copper
[4] NSR = Net Smelter Return
[5] CuEq = Copper Equivalent
[6] ZnEq = Zinc Equivalent
[7] Co = Total Cobalt

Table 4 : Ore Reserves cut-off grades

Site	Mineralisation	Mining Method	Cut-Off Value	Comments
Las Bambas	Primary Copper Ferrobamba	OP	0.17 – 0.21 %Cu	Range based on rock type recovery.
	Primary Copper Chalcobamba		0.20 – 0.25 %Cu	
	Primary Copper Sulfobamba		0.22 – 0.27 %Cu	
Kinsevere	Copper Oxide	OP	1.3% CuAS[1]	Approximate cut-off grades shown in this table for ex-pit material. Variable cut-off grade based on net value script.
		OP	1.0% CuAS[12]	For existing stockpiles reclaim.
Rosebery	(Zn, Cu, Pb, Au, Ag)	UG	A$165/t NSR[2]	
Dugald River	Primary Zinc	UG	A$138/t NSR[13]	

[1] CuAS = Acid Soluble Copper
[2] NSR = Net Smelter Return

PROCESSING RECOVERIES

Average processing recoveries are shown in Table 5 More detailed processing recovery relationships are provided in the Technical Appendix.

Table 5: Processing Recoveries

Site	Product	Recovery						Concentrate Moisture Assumptions
		Copper	Zinc	Lead	Silver	Gold	Mo	
Las Bambas	Copper Concentrate	86%	-	-	75%	71%		10%
	Molybdenum Concentrate						55%	5%
Rosebery	Zinc Concentrate		84%	6%	9%	7%		8%
	Lead Concentrate		8%	80%	41%	14%		7%
	Copper Concentrate	57%			41%	37%		8%
	Doré[1] (gold and silver)				0.2%	28%		
Dugald River	Zinc Concentrate	–	87%		35%	–		10%
	Lead Concentrate	–		64%	37%	–		10%
Kinsevere	Copper Cathode	76% (96% CuAS[2])	–	–	–	–		–

The Technical Appendix published on the MMG website contains additional Mineral Resources and Ore Reserves information (including the Table 1 disclosure).

[1] Silver in Rosebery doré is calculated as a constant ratio to gold in the doré. Silver is set to 0.17 against gold being 20.7
[2] CuAS = Acid Soluble Copper

MMG Mineral Resources and Ore Reserves Statement

as at 30 June 2019

Technical Appendix

22 October 2019

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APPROVALS PAGE

Signature	Name	Position	Date
	Rex Berthelsen	Group Manager Resource Geology	22/10/2019
Signature	**Name**	**Position**	**Date**
	Neil Colbourne	Group Manager Mining	22/10/2019
Signature	**Name**	**Position**	**Date**
	Geoffrey Senior	General Manager Group Technical Services	22/10/2019
Signature	**Name**	**Position**	**Date**

The above signed endorse and approve this Mineral Resources and Ore Reserves Statement Technical Appendix.

1 INTRODUCTION

On 20th December 2012 an updated JORC[1] Code was released – the previous release being the 2004 Edition. The JORC Code 2012 Edition defines the requirements for public reporting of Exploration Results, Mineral Resources and Ore Reserves by mining companies. Reporting according to the JORC Code is a requirement of the MMG listing on The Stock Exchange of Hong Kong[2] as per amendments to Chapter 18 of the Listing Rules that were announced on 3rd June 2010.

The core of the change to JORC Code is enhanced disclosure of the material information prepared by the Competent Person with the requirement for the addition of a publicly released detailed Appendix to the Mineral Resources and Ore Reserves release document, which outlines the supporting details to the Mineral Resources and Ore Reserves numbers.

This Technical Appendix provides these supporting details.

Under the JORC Code, reporting in compliance with the guidelines of JORC Code 2012 Edition became compulsory from 1 Dec 2013.

The principles governing the operation and application of the JORC Code are Transparency, Materiality and Competence:

- Transparency requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and not be misled by this information or by omission of material information that is known to the Competent Person.
- Materiality requires that a Public Report contains all the relevant information that investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgment regarding the Exploration Results, Mineral Resources or Ore Reserves being reported. Where relevant information is not supplied an explanation must be provided to justify its exclusion.
- Competence requires that the Public Report be based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics (the Competent Person).

[1] JORC = Joint Ore Reserves Committee.

[2] Specifically, the Updated Rules of Chapter 18 of the Hong Kong Stock Exchange Listing Rules require a Competent Person's report to comply with standards acceptable to the HKSE including JORC Code (the Australian code), NI 43-101 (the Canadian code) and SAMREC Code (the South African code) for Mineral Resources and Ore Reserves. MMG Limited has chosen to report using the JORC Code.

2 COMMON TO ALL SITES

The economic analysis undertaken for each Ore Reserves described in this document and for the whole Company has resulted in positive net present values (NPVs). MMG uses a discount rate appropriate to the size and nature of the organisation and individual deposits.

2.1 Commodity Price Assumptions

The price and foreign exchange assumptions used for the 2018 Mineral Resources and Ore Reserves estimation at the date at which work commenced on the Mineral Resources and Ore Reserves are as shown in Table 1.

Table 1 Price (real) and foreign exchange assumptions

	Ore Reserves	Mineral Resources
Cu (US$/lb)	3.18	3.64
Zn (US$/lb)	1.22	1.47
Pb (US$/lb)	0.90	1.08
Au US$/oz	1252	1461
Ag US$/oz	16.66	19.19
Mo (US$/lb)	8.58	9.81
Co (US$/lb)	23.23	30.19
USD:CAD	1.30	
AUD:USD	0.78	As per Ore Reserves
USD:PEN	3.20	

2.2 Competent Persons

Table 2 – Compenent Persons

Deposit	Accountability	Competent Person	Professional Membership	Employer
MMG Mineral Resources and Ore Reserves Committee	Mineral Resources	Rex Berthelsen[1]	HonFAusIMM(CP)	MMG
MMG Mineral Resources and Ore Reserves Committee	Ore Reserves	Neil Colourne[1]	MAusIMM	MMG
MMG Mineral Resources and Ore Reserves Committee	Metallurgy: Mineral Resources / Ore Reserves	Geoffrey Senior[1]	MAusIMM	MMG
Las Bambas	Mineral Resources	Rex Berthelsen[1]	HonFAusIMM(CP)	MMG
Las Bambas	Ore Reserves	Yao Wu[1]	MAusIMM(CP)	MMG
Las Bambas	Metallurgy: Mineral Resources / Ore Reserves	Amy Lamb[1]	MAusIMM(CP)	MMG
Kinsevere	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG
Kinsevere	Ore Reserves	Dean Bassille	MAusIMM(CP)	Mining One
Kinsevere	Metallurgy: Mineral Resources / Ore Reserves	Nigel Thiel[1]	MAusIMM(CP)	MMG
Rosebery	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG
Rosebery	Ore Reserves	Karel Steyn[1]	MAusIMM	MMG
Rosebery	Metallurgy: Mineral Resources / Ore Reserves	Kevin Rees	MAusIMM(CP)	MMG
Dugald River	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG
Dugald River	Ore Reserves	Karel Steyn[1]	MAusIMM	MMG
Dugald River	Metallurgy: Mineral Resources / Ore Reserves	Nigel Thiel[1]	MAusIMM(CP)	MMG
High Lake, Izok Lake	Mineral Resources	Allan Armitage	MAPEG[2] (P.Geo)	Formerly MMG
Sokoroshe, Nambulwa / DZ	Mineral Resources	Douglas Corley[1]	MAIG R.P.Geo.	MMG

The information in this report that relates to Mineral Resources and Ore Reserves is based on information compiled by the listed Competent Persons, who are Members or Fellows of the Australasian Institute of Mining and Metallurgy (AusIMM), the Australian Institute of Geoscientists (AIG) or a Recognised Professional Organisation (RPO) and have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as Competent Persons as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (2012 JORC Code). Each of the Competent Persons has given consent to the inclusion in the report of the matters based on their information in the form and context in which it appears.

[1] Participants in the MMG Long-Term Incentive Plans which may include Mineral Resources and Ore Reserves growth as a performance condition.

[2] Member of the Association of Professional Engineers and Geoscientists of British Columbia.

3 LAS BAMBAS OPERATION

3.1 Introduction and Setting

Las Bambas is a world class copper (Cu) mine with molybdenum (Mo), silver (Ag) and gold (Au) by-product credits. It is located in the Andes Mountains of southern Peru approximately 75km south-southwest of Cusco, approximately 300km north-northwest of Arequipa, and approximately 150km northeast of Espinar (also named Yauri). Las Bambas is readily accessible from either Cusco or Arequipa over a combination of sealed and good quality gravel roads. Road travel from Cusco takes approximately 6 hours, while road travel from Arequipa takes approximately 9 hours.

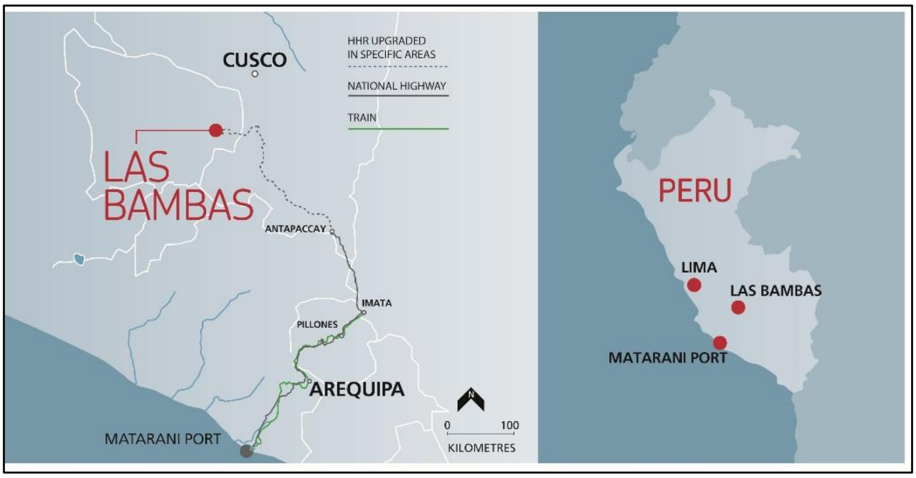


Figure 3-1 Las Bambas Mine location

Las Bambas is a truck and excavator mining operation with a conventional copper concentrator. Copper production commenced in the fourth quarter 2015 with the first concentrate achieved on 26 November. The first shipment of product departed the Port of Matarani for China on 15 January 2016. The mine has achieved full capacity, running at over 400,000 tonnes per day. Both lines of the copper concentrate plant have been commissioned. The primary crusher was commissioned during the fourth quarter of 2015 and the overland conveyor has now reached 100% capacity of 8,000 tonnes per hour. The tailings dam reached planned levels with discharge and water recirculation back to plant fully operational. Commercial production was declared on July 1, 2016.

Las Bambas is a joint venture project between the operator MMG (62.5%), a wholly owned subsidiary of Guoxin International Investment Co. Ltd (22.5%) and CITIC Metal Co. Ltd (15.0%).

The Mineral Resources and Ore Reserves have been updated with additional drilling completed in 2018 for the June 2019 report. The 2019 Mineral Resources estimation includes updated geological interpretation and estimation parameters.

3.2 Mineral Resources – Las Bambas

3.2.1 Results

The 2018 Las Bambas Mineral Resources is summarised in Table 3. The Las Bambas Mineral Resources is inclusive of the Ore Reserves. All data reported here is on a 100% asset basis. MMG's attributable interest in Las Bambas is 62.5%.

Table 3 2019 Las Bambas Mineral Resources tonnage and grade (as at 30 June 2019)

Las Bambas Mineral Resource									
						Contained Metal			
Ferrobamba Oxide Copper[1]	**Tonnes (Mt)**	**Copper (% Cu)**	**Silver (g/t Ag)**	**Gold (g/t Au)**	**Mo (ppm)**	**Copper (kt)**	**Silver (Moz)**	**Gold (Moz)**	**Mo (kt)**
Indicated	2.1	1.7				36			
Inferred	1.3	1.8				23			
Total	**3.4**	**1.7**				**59**			
Ferrobamba Primary Copper[2]									
Measured	553	0.56	2.4	0.05	202	3,080	43	0.8	112
Indicated	465	0.58	2.5	0.05	166	2,689	37	0.7	77
Inferred	239	0.61	1.3	0.03	79	1,448	10	0.2	19
Total	**1,257**	**0.57**	**2.2**	**0.04**	**166**	**7,218**	**90**	**1.8**	**208**
Ferrobamba Total	**1,261**	**0.58**				**7,277**	**90**	**1.8**	**208**
Chalcobamba Oxide Copper[1]									
Indicated	6.5	1.44				93			
Inferred	0.5	1.53				8			
Total	**7.0**	**1.45**				**101**			
Chalcobamba Primary Copper[2]									
Measured	113	0.44	1.4	0.02	153	493	5	0.06	17
Indicated	174	0.63	2.4	0.03	131	1,104	14	0.17	23
Inferred	38	0.51	1.8	0.02	115	191	2	0.03	4
Total	**325**	**0.55**	**2.0**	**0.02**	**137**	**1,789**	**21**	**0.26**	**45**
Chalcobamba Total	**332**	**0.57**	**2.0**	**0.02**	**134**	**1,889**	**21**	**0.26**	**45**
Sulfobamba Oxide Copper[1]									
Inferred									
Total									
Sulfobamba Primary Copper[2]									
Indicated	98	0.61	4.3	0.02	164	600	13	0.1	16
Inferred	133	0.50	5.2	0.02	119	670	22	0.1	16
Total	**230**	**0.55**	**4.8**	**0.02**	**138**	**1270**	**36**	**0.1**	**32**
Sulfobamba Total	**230**	**0.55**	**4.8**	**0.02**	**138**	**1,270**	**36**	**0.1**	**32**
Oxide Stockpiles									
Indicated	11.4	1.2				10			
Sulphide Stockpiles									
Measured	9.0	0.46	2.3		151	41	0.66		1.35
Total Contained	**1,844**	**0.58**				**10,613**	**148**	**2.2**	**286**

[1] 1% Cu Cut-off grade contained within a US$3.64/lb Cu pit shell for oxide material.
[2] 0.2% Cu Cut-off grade contained within a US$3.64/lb Cu pit shell for primary material.
Figures are rounded according to JORC Code guidelines and may show apparent addition errors.
Contained metal does not imply recoverable metal.

3.2.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 4 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 4 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Las Bambas Mineral Resources 2019

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sampling techniques	• Diamond drilling (DD) was used to obtain an average 2m sample that is half core split, crushed and pulverised to produce a pulp (95% passing 105µm). Diamond core is selected, marked and numbered for sampling by the logging geologist. Sample details are stored in an acQuire database for correlation with returned geochemical assay results. • Samples for analysis are bagged, shuffled, re-numbered and de-identified prior to dispatch. • Whole core was delivered to the Inspectorate Laboratory in Lima (2005-2010) and Certimin Laboratory in Lima (2014 to 2015) for half core splitting and sample preparation. From mid-2015 core samples were cut and sampled at an ALS sample preparation laboratory on-site. Samples are then sent to ALS Lima for preparation and analysis. • There are no inherent sampling problems recognised. • Measures taken to ensure sample representivity include the collection, and analysis of coarse crush duplicates.
Drilling techniques	• In 2018, two types of drilling were used. The traditional one with wireline diamond core drilling, and directional core both from surface. Generally, drill core is not oriented, however holes drilled for geotechnical purposes are oriented. All drillholes used in the Mineral Resource estimates have been drilled using HQ size.
Drill sample recovery	• Recovery is estimated by measuring the recovered core within a drill run length and recorded in the Geobank database. Run by run recovery has been recorded for 515,491m of the total 528,829m of diamond drilling in the data used for Mineral Resources estimation for the Sulfobamba, Chalcobamba and Ferrobamba deposits. Diamond drill recovery average is about 97% for all deposits (98% for Sulfobamba, 97% for Chalcobamba and Ferrobamba deposits). • The drilling process is controlled by the drill crew and geological supervision provides a means for maximising sample recovery and ensures suitable core presentation. No other measures are taken to maximise core recovery. • There is no detectable correlation between recovery and grade which can be determined from graphical and statistical analysis. Preferential loss/gains of fine or coarse materials are not significant and do not result in sample bias as the nature of mineralisation is stockwork veins and disseminated sulphides. Diamond core sampling is applied, and recovery is considered high.
Logging	• 100% of diamond drill core used in the Mineral Resource estimates has been geologically and geotechnically logged to support Mineral Resources estimation, mining and metallurgy studies. • Geological logging is qualitative and geotechnical logging is quantitative. All drill core is photographed.

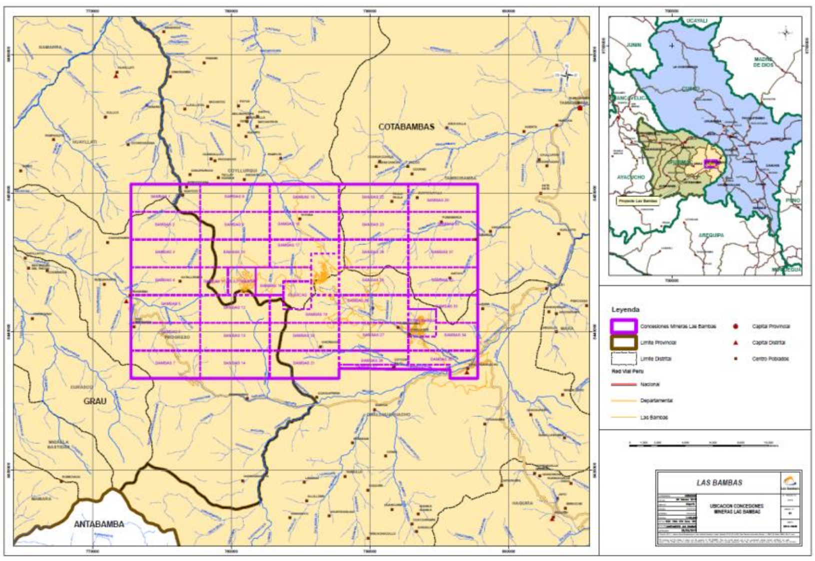
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sub-sampling techniques and sample preparation	• All samples included in the Mineral Resource estimates are from diamond drill core. Drill core is longitudinally sawn to provide half-core samples within intervals directed by the logging geologist. The remaining half-core is kept and stored in the original sample tray. The standard sampling length is 2m for PQ core (minimum 1.2m) and HQ core (minimum 1.2m, maximum 2.2m) while NQ core is sampled at 2.5m (minimum 1.5m). Sample intervals do not cross geological boundaries. • From 2005 until 2010 geological samples have been processed in the following manner: Dried, crushed, pulverised to 95% passing 105µm. Sizing analysis is carried out on 1 in 30 samples. • From 2010 geological samples have been processed in the following manner: Dried, crushed, pulverised to 95% passing 105µm. Sizing analyses are carried out on one in 10-15 samples. • Representivity of samples is checked by duplication at the crush stage one in every 40 samples. No field duplicates are taken. • Twelve month rolling Quality Assurance / Quality Control (QAQC) analysis of sample preparation techniques indicate the process is appropriate for Las Bambas samples. • The sample types, nature, quality and sample preparation techniques are considered appropriate for the style of the Las Bambas mineralisation (porphyry and skarn Cu-Mo mineralisation) by the Competent Person.
Quality of assay data and laboratory tests	• From 2005 until 2010 the assay methods undertaken by Inspectorate (Lima) for Las Bambas were as follows: o Cu, Ag, Pb, Zn, Mo - 0.5g of sample. Digestion by 4-Acids. Reading by Atomic Absorption Spectrometry (AAS). o Acid soluble - 0.2g sample. Leaching by a 15% solution of H_2SO_4 at 73°C for 5 minutes. Reading by AAS. o Acid soluble - 0.2g of sample. Digestion by a citric acid solution at 65°C for 15 minutes. Reading by AAS. o Au - Cupellation at 950°C. Reading by AAS. Above detection limit analysis by gravimetry. o 35 elements - Digestion by aqua-regia and reading by ICP. • From 2010 to 2015 routine assay methods undertaken by Certimin (Lima) for Las Bambas are as follows: o Cu, Ag, Pb, Zn, Mo - 0.5g of sample. Digestion by 4-Acids. Reading by Atomic Absorption Spectrometry (AAS). o Acid soluble copper – 0.2g sample. Leaching by a 15% solution of H_2SO_4 at 73°C for 5 minutes. Reading by AAS. o Acid Soluble copper - 0.2g of sample. Digestion by a citric acid solution at 65°C for 15 minutes. Reading by AAS. o Au - Fire assay with AAS Finish. Over-range results are re-assayed by Gravimetric Finish. o 35 elements - Digestion by aqua-regia and reading by ICP. • From 2015 to present routine assay methods undertaken by ALS (Lima) for Las Bambas are as follows: o Cu, Ag, Pb, Zn, Mo - 0.5g of sample. Digestion by 4-Acids. Reading by Atomic Absorption Spectrometry (AAS).

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	○ Acid soluble copper – 0.5g sample. Leaching by a 5% solution of H_2SO_4 at ambient temperature for 1 hour. Reading by AAS. ○ Au - Fire assay with AAS Finish. Over-range results are re-assayed by Gravimetric Finish. ○ 35 elements - Digestion by aqua-regia and reading by ICP. • From 2018 to present routine assay methods undertaken by ALS (Lima) for Las Bambas are as follows: ○ Cu, Ag, Mo. Digestion by 4-Acids. Reading by Atomic Absorption ○ Cu. Sequential Cu. Reported as soluble in sulfuric acid, Soluble in cyanide and residual. ○ Au - Fire assay with AAS Finish. Over-range results are re-assayed by Gravimetric Finish. ○ 60 elements - Digestion by 4-Acids and reading by ICP, includes a packet of rare earth elements. • All the above methods with the exception of the acid soluble copper are considered total digest. • Between 2013 and 2016, composited pulps have been submitted to Certimin Laboratory for sequential copper analysis. This method produced results of acid soluble (H_2SO_4), then cyanide soluble followed by residual copper in sequence. This analysis was used for geometallurgical modelling. • No geophysical tools, spectrometers or handheld XRF instruments have been used in the analysis of samples external to the ALS laboratory for the estimation of Mineral Resources. • Assay techniques are considered suitable and representative; independent umpire laboratory checks occurred routinely between 2005-2010 using the ALS Chemex laboratory in Lima. Check samples were inserted at a rate of 1 in every 25 samples (2005-2007), every 50 samples (2008) and every 40 samples (2010). For the 2014 to 2018 programs, duplicated samples were collected at the time of sampling and securely stored. Samples were then sent to the Inspectorate Laboratory, Lima, for third party (umpire) analysis. The samples were selected at a rate of 1:40. Results received indicate a good correlation between datasets and show no significative bias for copper, molybdenum, silver and gold. • ALS release quarterly QAQC data to Las Bambas for analysis of internal laboratory standard performance. The performance of the laboratory internal standards is within acceptable limits. • Las Bambas routinely insert: ○ Primary coarse duplicates: Inserted at a rate of 1:25 samples (2005-2007), 1:50 samples (2008), and 1:40 samples (2010-2018). ○ Coarse blank samples: Inserted after a high-grade sample (coarse blank samples currently make up about 4.1% of all samples analysed). ○ Pulp duplicates samples: Inserted 1:25 samples (2005-2007), 1:50 samples (2008), and 1:40 samples (2010-2018). ○ Pulp blank samples: Inserted before the coarse blank sample and always after a high grade sample (pulp blank samples currently make up about 4.1% of all samples analysed).

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	o Certified Reference Material (CRM) samples: Inserted at a rate of 1:50 samples (2005-2006), 1:40 samples (2007) and 1:20 samples (2008 to 2018). • QAQC analysis has shown that: o Blanks: no significative evidence of contamination has been identified during the sample preparation and assay. o Duplicates: the analytical precision is within acceptable ranges when compared to the original sample, i.e., more than 90% of the pairs of samples are within the error limits evaluated for a maximum relative error of 10% (R^2>0.90). In 2018, all average CV calculated from coarse and pulp duplicates are acceptable. These results were also repeated in the external ALS check samples. o Certified Reference Material: acceptable levels of accuracy and precision have been established. o Sizing test results were applied to 3% of samples. In 2018, sizing tests results are into acceptable parameters.
Verification of sampling and assaying	• Verification by independent personnel was not undertaken at the time of drilling. However, drilling, core logging and sampling data is entered by geologists; assay results are entered by the resource geologist after data is checked for outliers, sample swaps, performance of duplicates, blanks and standards, and significant intersections are checked against core log entries and core photos. Errors are rectified before data is entered into the database. • Apart from 20 metallurgical drillholes drilled in 2007 which twinned Mineral Resource Ferrobamba drillholes, no twinned drillholes have been completed. • All drillholes are logged using laptop computers directly into the drillhole database (Geobank). Prior to November 2014 diamond drillholes were logged on paper and transcribed into the database. Assay results are provided in digital format (both spreadsheet and PDF) by the laboratories and are automatically loaded into the database after validation. All laboratory primary data and certificates are stored on the Las Bambas server. • The database has internal validation processes which prevent invalid or unapproved records from being stored. Additional manual data validation occurs in Vulcan software before data is used for interpretation and Mineral Resources modelling. Unreliable data is flagged and excluded from Mineral Resources estimation work. • No adjustments have been made to assay data – if there is any doubt about the data quality or location, the drillhole is excluded from the estimation process.
Location of data points	• In 2005 collar positions of surface drillholes were picked up by Horizons South America using Trimble 5700 differential GPS equipment. From 2006, the Las Bambas engineering personnel have performed all subsequent surveys using the same equipment. Since 2014, drillholes are set out using UTM co-ordinates with a hand held Differential Global Positioning System (DGPS) and are accurate to within 1m. On completion of drilling, collar locations are picked up by the onsite surveyors using DGPS (Trimble or Topcon). These collar locations are accurate to within 0.5m. • During the 2014 due diligence process (2014) RPM independently checked five collar locations at Ferrobamba and Chalcobamba with a handheld GPS and noted only small differences and well within the error limit of the GPS used. RPM did not

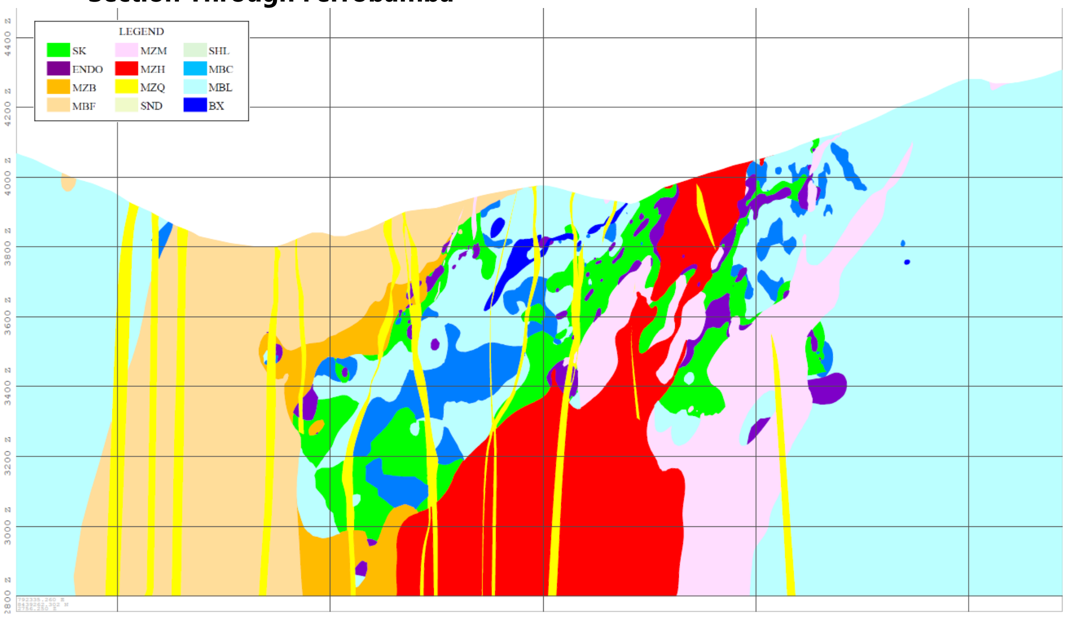
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	undertake independent checking of any Sulfobamba drillholes. The collar locations are considered accurate for Mineral Resources estimation work. • In 2005 the drilling contractor conducted downhole survey's using the AccuShot method for non-vertical drillholes. Vertical holes were not surveyed. If the AccuShot arrangement was not working, the acid test (inclination only) was used. Since 2006, all drillholes are surveyed using Reflex Maxibor II equipment units which take measurements every 3m. The downhole surveys are considered accurate for Mineral Resources estimation work. • The datum used is WGS 84 with a UTM coordinate system zone 19 South. • In 2006 Horizons South America surveyed the topography at a scale of 1:1000 based on aerophotogrammetric restitution of orthophotos. A digital model of the land was generated every 10m and, using interpolation, contour lines were obtained every metre. The maps delivered were drafted in UTM coordinates and the projections used were WGS 84 and PSAD 56. A triangulated surface model presumably derived from this survey is in current use at site and is considered suitable for Mineral Resources and Ore Reserves estimation purposes. • Downhole surveys are now routinely completed by modern gyroscope techniques. Instruments such as EZ-Gyro and Gyro Sprint-IQ are employed.
Data spacing and distribution	• The Las Bambas mineral deposits are drilled on variable spacing dependent on rock type (porphyry vs. skarn). Drill spacing typically ranges from 100m x 100m to 25m x 25m and is considered sufficient to establish the degree of geological and grade continuity appropriate for Mineral Resources estimation and classifications applied. • Drillhole spacing of approximately 25m x 25m within skarn hosted material and 50m x 50m within porphyry hosted is considered sufficient for long term Mineral Resources estimation purposes based on a drillhole spacing study undertaken in 2015. While the 25m spacing is suitable for Mineral Resource estimation, the Las Bambas deposits tend to have short scale 5m - 10m variations within the skarn that are not captured by the infill drilling at this spacing. This localised geological variability is captured by mapping and drillhole logging. • Diamond drillhole samples are not composited prior to routine chemical analysis; however, the nominal sample length is generally 2m. • Currently the pulps are sent for sequential copper analysis in samples that exceed 0.1% Cu.
Orientation of data in relation to geological structure	• Overall drillhole orientation is planned at 90 degrees to the strike of the mineralised zone for each deposit. Drillhole spacing and orientation is planned to provide evenly spaced, high angle intercepts of the mineralised zone where possible, thus minimising sampling bias related to orientation. However, in some areas of Ferrobamba where skarn mineralisation is orientated along strike, holes orientations were not adjusted. • Drilling orientation is not considered to have introduced sampling bias.
Sample security	• Measures to provide sample security include: o Adequately trained and supervised sampling personnel.

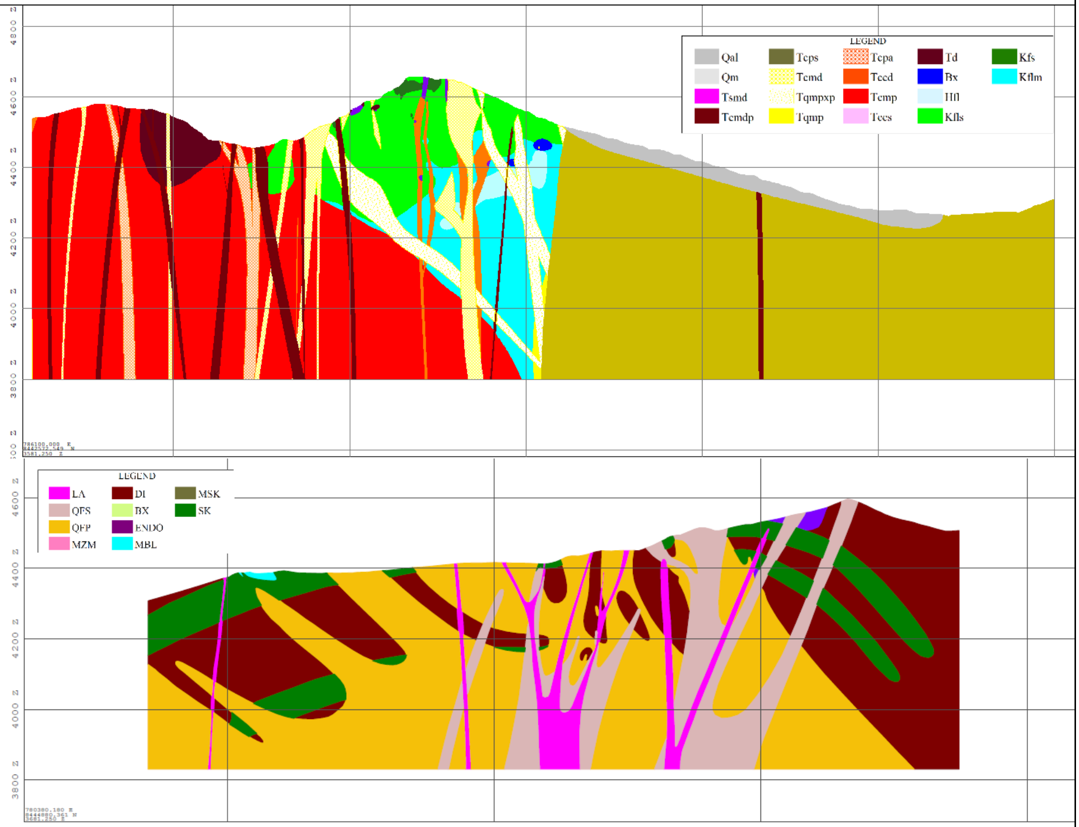
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	○ Samples are stored in a locked compound with restricted access during preparation. ○ Dispatch to various laboratories via contract transport provider in sealed containers. ○ Receipt of samples acknowledged by receiving analytical laboratory by email and checked against expected submission list. ○ Assay data returned separately in both spreadsheet and PDF formats.
Audit and reviews	• In 2015, an internal audit, checking 5% of the total samples contained in the acQuire database was undertaken comparing database entry values to the original laboratory certificates for Cu, Ag, Mo, As and S. No material issues were identified. • Internal audits of the Inspectorate and Certimin laboratories have occurred twice a month by Las Bambas personnel. Historically, any issues identified have been rectified. Currently, there are no outstanding material issues. • An independent third-party audit was completed by AMC Consultants (Brisbane office) on the 2017 Mineral Resource model in February 2018. The audit identified some minor improvements to the estimation process but concluded there were not material issues or risks to long term mine planning. • The Competent Person has visited the both the Certimin and ALS laboratories in Lima.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Mineral tenement and land tenure status	• The Las Bambas project has tenure over 41 Mineral Concessions. These Mineral Concessions secure the right to the minerals in the area, but do not provide rights to the surface land. • Property of surface land is acquired through a separate process. The below map outlines the 41 Mineral Concessions and the mine property owned by MMG. 

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	• Tenure over the 41 Concessions is in good standing. There are no known impediments to operating in the area.
Exploration done by other parties	• The Las Bambas project has a long history of exploration by the current and previous owners. • Exploration commenced in 1966 with around 450km of surface diamond drilling drilled to date. • Initial exploration was completed by Cerro de Pasco followed by Cyprus, Phelps Dodge, BHP, Tech, and Pro Invest prior to Xstrata Resources definition drilling which commenced in 2005. All historical drilling is outlined in the table below. Glencore and Xstrata merged to form Glencore plc. In 2013, MMG Ltd, Guoxin International Investment Corporation. Limited and CITIC Metal Co., Ltd enter into an agreement to purchase the Las Bambas project from Glencore plc.

Company	Year	Deposit	Purpose	Type	# of DDH	Drill size	Metres Drilled
Cerro de Pasco	1996	Chalcobamba	Exploration	DDH	6	Unknown	906
Cyprus	1996	Chalcobamba	Exploration	DDH	9	Unknown	1,367
Phelps Dodge	1997	Ferrobamba	Exploration	DDH	4	Unknown	737
		Chalcobamba			4		653
BHP	1997	Ferrobamba	Exploration	DDH	3	Unknown	365
		Chalcobamba			4		658
Pro Invest	2003	Ferrobamba	Exploration	DDH	4	HQ	738
		Chalcobamba			7		1,590
Xtrata	2005	Ferrobamba	Resource Evaluation	DDH	109	HQ	26,839
		Chalcobamba			66		14,754
		Sulfobamba			60		13,943
	2006	Ferrobamba	Resource Evaluation	DDH	125	HQ	51,004
		Chalcobamba			95		27,982
		Sulfobamba			60		16,971
		Charcas			8		2,614
		Azuljaja			4		1,968
	2007	Ferrobamba	Resource Evaluation	DDH	131	HQ	46,710
		Chalcobamba			134		36,617
		Sulfobamba			22		4,996
	2008	Ferrobamba	Resource Evaluation	DDH	118	HQ	46,773
		Chalcobamba			90		22,096
	2010	Ferrobamba	Resource Evaluation	DDH	91	HQ	28,399
MMG	2014	Ferrobamba	Resource Evaluation	DDH	23	HQ	12,609
	2015	Huancarane	Sterilisation	DDH	5	HQ	772
	2015	Ferrobamba	Resource Evaluation	DDH	154	HQ	53,771
	2016	Ferrobamba	Resource Evaluation	DDH	114	HQ	31,206
		Chalcobamba	Resource Evaluation	DDH	13		1,880
	2017	Ferrobamba	Resource Evaluation	DDH	49	HQ	1,181
	2018	Ferrobamba	Resource Evaluation	DDH	82	HQ	48,021
		Chalcobamba	Resource Evaluation	DDH	48		10,192
			Total		1642		**508,702**

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Geology	• Las Bambas is located in a belt of Cu (Mo-Au) skarn deposits associated with porphyry type systems situated in south-eastern Peru. This metallogenic belt is controlled by the Andahuaylas-Yauri Batholith of Eocene- Oligocene age, which is emplaced in Mesozoic sedimentary units, with the Ferrobamba Formation (Lower to Upper Cretaceous) being of greatest mineralising importance. • The porphyry style mineralisation occurs in quartz-monzonite to granodiorite rocks. Hypogene copper sulphides are the main copper bearing minerals with minor occurrence of supergene copper oxides and carbonates near surface. The intrusive rocks of the batholith in contact with the Ferrobamba limestones gave rise to contact metamorphism and, in certain locations, skarn bodies with Cu (Mo-Au) mineralisation.
Drillhole information	• Historical exploration drillholes (prior to 2005) have been excluded from the Mineral Resource estimates. • Drillhole data is not provided in this report as this report is for the Las Bambas Mineral Resources which use all available data and no single hole is material for the Mineral Resource estimates.
Data aggregation methods	• Historical exploration drillholes (prior to 2005) have been excluded from the Mineral Resource estimates. • No metal equivalents were used in the Mineral Resources estimation.
Relationship between mineralisatio n width and intercepts lengths	• No exploration diamond drillholes have been completed in the 2018 reporting period. Historical exploration drillholes (prior to 2005) have been excluded from the Mineral Resource estimates. • Mineralisation true widths are captured by interpreted mineralisation 3D wireframes. Drillholes are drilled to achieve intersections as close to orthogonal as possible.
Diagrams	**Section Through Ferrobamba**  **Section Through Chalcobamba**

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	 **Section Through Sulfobamba**
Balanced reporting	• All drilling completed during the 2018 reporting period completed at Ferrobamba is infill in nature. Historical exploration drillholes (prior to 2005) have been excluded from the Mineral Resource estimates. A small number of holes were drilled at Chalcobamba for the purpose of hydrogeology, geotechnical and infill.
Other substantive exploration data	• No substantive exploration diamond drillholes have been completed in the 2018 reporting period. Historical exploration drillholes (prior to 2005) have been excluded from the Mineral Resource estimates. • In previous years, several orebody knowledge studies have been carried out including skarn zonation, vein densities and a large age dating program. Results from these studies are assisting with improving the understanding of the orebodies. Studies on clay and talc mapping have also commenced, however the information is pending analysis. This work will continue.
Further work	• An ongoing program of regional and deposit scale mapping, cross sectional studies, infrared spectral analyses, isotopic and petrographic studies and soil sampling. • A program of exploration assessment and targeting is currently underway to identify exploration options for the Las Bambas leases. • Permitting for regional exploration drilling is underway. • Ongoing infill programs are planned to increase deposit confidence to support the short to medium term mine plan, In addition, the Las Bambas Mineral Resource has potential to grow to extend the life of the mine and/or support expansions and replace the annual mined Ore Reserve depletion.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Database integrity	• The following measures are in place to ensure database integrity: ○ All Las Bambas drillhole data is stored in an SQL database (Geobank) on the Las Bambas site server, which is regularly backed-up. ○ The entire database was migrated from acQuire to Geobank in 2019 ○ Geological logging is entered directly into laptop computers which are uploaded to the database. Prior to November 2014, diamond drillholes were logged on paper logging forms and transcribed into the database. From November 2015 logging was entered directly into a customised interface using portable tablet computers. ○ Assays are loaded directly into the database from digital files provided from the assay laboratory. ○ The measures described above ensure that transcription or data entry errors are minimised. • Data validation procedures include: ○ A database validation project was undertaken in early 2015 checking 5% of the assayed samples in the database against original laboratory certificates. No material issues were identified. ○ The database has internal validation processes which prevent invalid or unapproved records to be stored.
Site visits	• The Competent Person has undertaken numerous site visits to Las Bambas since acquisition. In the view of the Competent Person there are no material risks to the Mineral Resources based on observations of the site's geological practices. • Several site visits to the Ferrobamba area and the Chalcobamba area have been conducted but due to local community restrictions, the Competent Person has been unable to visit Sulfobamba to date. • The site previously employed a practice of 'double blind' sample randomisation at the laboratory. It essentially guarantees the secrecy of the results from the operating laboratory. It does however pose a minor risk of compromising sample provenance, although the risk is probably low. This practice has now ceased.
Geological interpretation	• There is good confidence on the geological continuity and interpretation of the Ferrobamba and Chalcobamba deposits. Confidence in the Sulfobamba deposit is considered moderate due to limited drilling. • The 2018 geological interpretation was undertaken on paper sections orientated perpendicular to the established structural trend of each deposit. Section spacing for the interpretations varied between deposits from 25m at Ferrobamba and Chalcobamba to 50m at Sulfobamba. The geological logging, assay data and surface mapping were used in the interpretation. The drilling and surface mapping were checked against each other to ensure they were concordant. • No alternative interpretations have been generated for the Las Bambas mineralisation and geology. • Exploratory data analysis (EDA) indicated that the lithological characterisation used for the 2010 geological interpretation were for the most part valid (with minor changes) and were applied for the 2018 modelling. Each lithological unit was modelled according to age, with the youngest modelled first. Structural considerations such as

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	plunge of the units, folding and faults were taken into consideration (where information existed). Orthogonal sections were also interpreted to ensure lithological continuity. • In 2018, Chalcobamba's geological model and interpretation was changed based on a complete relog of the deposit combined with detailed surface mapping. An additional high-grade skarn domain was added based on 0.5% Cu cut off. • Oxidation domains were produced for the Ferrobamba and Chalcobamba models. Oxidation domains were based on logged mineral species, sequential copper and acid soluble copper to total copper assay ratios, each of which had a priority to represent the oxidation field. • Geological interpretations were then modelled as wireframe solids (based on the paper sections) and were peer reviewed within the Las Bambas Geology department and by the Competent Person. • Specific grade domains (copper and molybdenum) were not created, except for interpreted, spatially coherent high-grade shoots at Sulfobamba. A domain cut-off of 0.8% Cu was used for the high-grade domain, and by Chalcobamba was used a domain cut-off of 0.5% Cu. The introduction of the high-grade domain was supported by EDA, contact plots, and change of support analysis.
Dimensions	• The Las Bambas Mineral Resources comprise three distinct deposits; each have been defined by drilling and estimated: o Ferrobamba Mineral Resources occupies a footprint which is 2500m N-S and 1800m E-W and over 900m vertically. o Chalcobamba Mineral Resources occupies a footprint of 2300m N-S and 1300m E-W and 800m vertically o Sulfobamba Mineral Resources is 1800m along strike in a NE direction and 850m across strike in a NW direction and 450m deep.
Estimation and modelling techniques	• Mineral Resources estimation for the three deposits has been undertaken in Vulcan (Maptek) mining software with the following key assumptions and parameters: • Ordinary Kriging interpolation has been applied for the estimation of Cu, Mo, Ag, Au, As, Ca, Mg, Fe, S, CuAS (acid soluble copper), CuCN (cyanide soluble copper), CuRE (residual copper) and density. This is considered appropriate for the estimation of Mineral Resources at Las Bambas. • The Ferrobamba, Chalcobamba and Sulfobamba block models utilised sub-blocking. Models were then regularised for use in mine planning purposes. • Extreme grade values were managed by upper grade capping based on statistical assessment evaluated for all variables and domains. Consideration was also given to the metal content above the top cap value. • All elements were estimated into lithology domains. At Ferrobamba five different orientation domains were identified in the skarn and were used in the interpolation. The boundaries between each orientation domain were treated as semi-soft boundaries. At Sulfobamba high-grade skarn shoots were identified and were used in the interpolation of copper only. The boundaries between the low and the high-grade skarn were treated as hard boundaries.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• Data compositing for estimation was set to 4m, which matches two times the majority of drillhole sample lengths (2m), provides good definition across interpreted domains, and adequately accounts for bench height. • Variogram analysis was updated for Ferrobamba and Chalcobamba deposits while the Sulfobamba model was not updated. Variogram analysis was undertaken in Vulcan software. • No assumptions have been made about the correlation between variables. All variables are comparably informed and independently estimated. o Interpolation was undertaken in three to four passes. • Check estimates using Discrete Gaussian change of support modelling have been performed on all models. Block model results are comparable with previous Mineral Resources estimations after changes due to drilling and re-modelling by the site. • Assumptions about the recovery of by-products are accounted in the net-smelter return (NSR) calculation which includes the recovery of Mo, Ag and Au along with the standard payable terms. • Arsenic is considered a deleterious element and has been estimated. It is not considered a material risk. Sulphur, calcium and magnesium are also estimated to assist in the determination of NAF (non-acid forming), PAF (potentially acid forming) and acid neutralising material. • Block sizes for all three deposits were selected based on Quantitative Kriging Neighbourhood Analysis (QKNA). The Ferrobamba block size was 20m x 20m x 15m with sub-blocks of 5m x 5m x 5m. Chalcobamba block size was set to 25m x 25m x 15m, with sub-blocks of 5m x 5m x 5m. The block size at Sulfobamba was set to 50m x 50m x 15m (sub-blocked to 25m x 25m x 7.5m) which roughly equates to the drill spacing. The search anisotropy employed was based on both the ranges of the variograms and the drill spacing. All models were regularised to 20m x 20m x 15m for use in Ore Reserve estimates. • The selective mining unit is assumed to be approximately 20m x 20m x 15m (x,y,z) which equates to the Ferrobamba block model block size. • Block model validation was conducted by the following processes – no material issues were identified: • Visual inspections for true fit for all wireframes (to check for correct placement of blocks and sub-blocks). • Visual comparison of block model grades against composite sample grades. • Global statistical comparison of the estimated block model grades against the declustered composite statistics. • Change of support analysis on major lithological domains. • Swath plots and drift plots were generated and checked for skarn and porphyry domains.
Moisture	• All tonnages are stated on a dry basis.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Cut-off parameters	• The Mineral Resources are reported above a range of cut-offs based on material type and ore body. The cut-off grades range from 0.14% Cu cut-off grade for hypogene material to 0.18% Cu for marble/calc-silicate hosted material and 0.16% Cu for breccia at Ferrobamba. Oxide material has been reported above a 1% Cu cut-off grade. The reported Mineral Resources have also been constrained within a US$3.64/lb Cu pit shell with revenue factor=1. • The reporting cut-off grade is in line with MMG's policy on reporting of Mineral Resources which considers current and future mining and processing costs and satisfies the requirement for prospects for future economic extraction.
Mining factors or assumptions	• Mining of the Las Bambas deposits is undertaken by open pit method, which is expected to continue throughout the life of mine. Large scale mining equipment including 300 tonne trucks and 100 tonne electric face shovels are used for material movement. • During block regularisation, internal dilution is included to produce full block estimates. • Further information on mining factors is provided in Section 4 of this table. • No other mining factors have been applied to the Mineral Resources.
Metallurgical factors or assumptions.	• Currently the processing of oxide copper mineralisation has not been studied to pre-feasibility or feasibility study level. The inclusion of oxide copper Mineral Resources assumes that processing of very similar ores at Tintaya was completed successfully in the past where a head grade of greater than 1.5% Cu was required for favourable economics. This assumption has been used at this stage for the oxide copper mineralisation. • Sulphide and partially oxidised material is included in the Mineral Resources which is expected to be converted to Ore Reserves and treated in the onsite concentrator facilities. • No other metallurgical factors have been applied to the Mineral Resources.
Environmental factors or assumptions	• Environmental factors are considered in the Las Bambas life of asset work, which is updated annually and includes provision for mine closure. • Geochemical characterisation undertaken in 2007, 2009 and 2017 indicate most of the waste rock from Ferrobamba and Chalcobamba deposits to be Non-Acid Forming (NAF) and that no acid rock drainage from the waste rock dumps from these two pits should be expected. Waste rock samples from Sulfobamba were found to contain higher concentrations of sulphur and that 30% to 40% of waste rock could be Potentially Acid Forming (PAF). Suitable controls will be implemented for all PAF waste rock, including investigating opportunities for backfill into pit voids. Additional geochemical characterisation work is ongoing. • Tailings generated from processing of Ferrobamba and Chalcobamba were determined to be NAF. Geochemical characterisation of tailings generated from processing of Sulfobamba ores is currently under assessment, however for environmental assessment purposes it was assumed to have PAF behaviour. Current Life of Asset schedules have Ferrobamba tailings processing scheduled for several years after Sulfobamba tailings are processed. A closure plan was submitted and

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	approved by the regulator in 2016 and describes the encapsulation method for Sulfobamba tailings. • Based on the current TSF design and the design assumptions for dry settled density and beach angle, the TSF at Las Bambas has a final capacity of 784Mt of tailings from processing 800Mt. Three studies have been conducted looking at increasing tailings storage capacity at Las Bambas: • Tailings characterisation test work to assess final settled density and beach slope in current TSF. • Options assessment to increase capacity at TSF currently under construction. • Pre-feasibility study for an additional TSF.
Bulk density	• Bulk density is determined using the Archimedes' principle (weight in air and weight in water method). Samples of 20cm in length are measured at a frequency of approximately one per core tray and based on geological domains. The density measurements are considered representative of each lithology domain. • Bulk density measurement occurs at the external, independent assay laboratory. The core is air dried and whole core is wax coated prior to bulk density determination to ensure that void spaces are accounted for. • Density values in the Mineral Resources models are estimated using Ordinary Kriging within the lithology domain shapes. Un-estimated blocks were assigned a density value based on an expected value of un-mineralised rock within each geological domain.
Classification	• Mineral Resource classifications use criteria that required a certain minimum number of drillholes. The requirement of more than one drillhole ensures that any interpolated block was informed by sufficient spatially distributed samples to establish grade continuity. Furthermore, rock type specific hole spacing (skarn vs. porphyry) were used to classify each Mineral Resource category. • Drillhole spacing for classification were based on an internal Ferrobamba drillhole spacing study undertaken in 2015. Results from the study indicate: o Measured Mineral Resources: 25m x 25m drillhole spacing in the skarn, 50m x 50m drillhole spacing for the porphyry. o Indicated Mineral Resources: 50m x 50m drillhole spacing in the skarn, 100m x 100m drillhole spacing for the porphyry. o Inferred Mineral Resources are generally defined as twice the spacing of Indicated Mineral Resources with regard to each rock type. • Only copper estimates were used for classification. Estimation confidence of deleterious elements such as arsenic was not considered for classification purposes. • The Mineral Resource classification applied appropriately reflects the Competent Person's view of the deposit.
Audits or reviews	• Historical models have all been subject to a series of internal and external reviews during their history of development. The recommendations of each review have been implemented at the next update of the relevant Mineral Resource estimates. • Several extensive reviews were undertaken as part of the MMG due diligence process for the purchase of Las Bambas. These reviews included work done by Runge Pincock

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	Minarco (RPM), which resulted in the published Competent Person report in 2014. In addition, significant review work was carried out by AMEC. No fatal flaws were detected in these reviews and all recommendations were considered and addressed in the 2015 Mineral Resources update and all subsequent updates. • A self-assessment of all 2018 Mineral Resource modelling was completed by the Competent Person using a standardised MMG template. No fatal flaws were detected in the review. Areas previously identified for improvement have been addressed and include: o Mineral Resource classification for the Ferrobamba block model uses a wireframe shape to constrain the final Mineral Resource category. o Sequential copper results are used to model an oxidation type domain. This is in turn used to constrain the sulfuric acid, cyanuric acid and residual estimate. • An external third-party audit was undertaken in 2018 on the 2017 Mineral Resource by AMC Consultants
Discussion of relative accuracy / confidence	• There is high geological confidence of the spatial location, continuity and estimated grades of the modelled lithologies within the Mineral Resources. Minor, local variations are expected to occur on a sub-25m scale that is not detectable by the current drill spacing. Global declustered statistics of the composite databases on a domain basis were compared against the block model. Block model estimates were within 10% of the composite database. Local swath plots were undertaken for each deposit. All plots showed appropriate smoothing of composite samples with respect to estimated block grades. • The Las Bambas Mineral Resource estimates are considered suitable for Ore Reserve estimation and mine design purposes. The Mineral Resources model was evaluated using the discrete Gaussian change of support method for copper in most domains. Based on the grade tonnage curves generated, the Mineral Resources model should be a reasonable predictor of tonnes and grade selected during mining. • Reconciliation of the last 12 months of production indicates that the mine planning block model has over-called the ore control model (F1) by 6% for copper metal. This comprises a 7% over-call of grade and a 12% under-call of tonnage.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**

	Block Model	Factor	Grade	Tonnes	Metal
Year to June 2018	2018	F1	1.09	0.88	0.96
		F2	0.95	0.95	0.91
		F3	1.04	0.84	0.88
1 July 2017 to 30 June 2018	2019	F1	1.12	0.91	1.02
		F2	0.91	0.97	0.89
		F3	1.02	0.88	0.90
1 July 2018 to 30 June 2019	2019	F1	1.07	0.88	0.94
		F2	0.98	0.94	0.92
		F3	1.04	0.83	0.86
All (since commercial production start)	2019	F1	1.12	0.92	1.02
		F2	0.96	0.94	0.90
		F3	1.07	0.86	0.92

F1 Ore Control / Ore Reserve

F2 Mill / Ore Control

F3 Mill / Ore Reserve

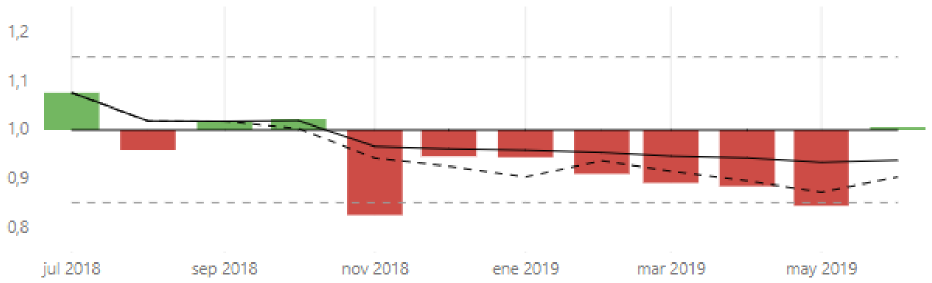
Note the 3% Assay correction for the Mill (applied in 2018) has been removed

- The F1 reconciliation indicates that the 2019 model has over-called metal by 6% for the year to June 2019 compared to under-calling by 2% for the year to June 2018.
- The F3 (Mill / Reserve) reconciliation indicates that the Reserve model has over-called metal by 14%, and for tonnes by 17% for the year ended June 2019. The project to date reconciliation shows the Reserve has over-called metal production (F3) by 8% while the F1 metal of 2% under-call is consistent with prior years' models.
- Further analysis using the F2 reconciliation factor (Mill / Grade Control) for the year ending June 2019 shows that metal is 8% lower, comprising 6% lower tonnes and 2% lower grade received by the mill than estimated by the mine. The F2 factor result indicates that ore loss and dilution are issues that need to be addressed. Both the F2 and F3 factors are affected by ore loss and dilution.

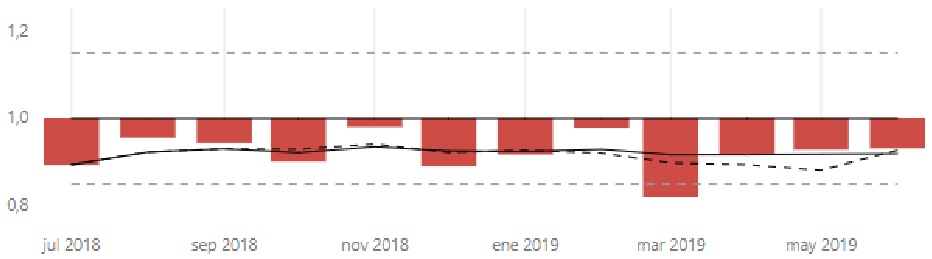
Section 3 Estimating and Reporting of Mineral Resources

Criteria	Commentary

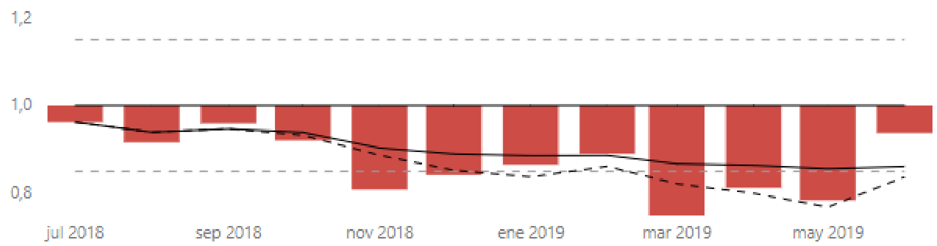
F1: Polygon Ore / Reserve Model Ore



F2: Plant+Stk Delta / Polygon Ore



F3: Plant+Stk Delta / Reserve Model Ore



- The accuracy and confidence of the 2019 Mineral Resource estimates are considered suitable for use as an input to Ore Reserve estimation and public reporting by the Competent Person.

3.2.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resources statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

3.2.3.1 Competent Person Statement

I, Rex Berthelsen, confirm that I am the Competent Person for the Las Bambas Mineral Resources section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am an Honorary Fellow of The Australasian Institute of Mining and Metallurgy and hold Chartered Professional accreditation in the field of Geology
- I have reviewed the relevant Las Bambas Mineral Resources section of this Report to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Las Bambas Mineral Resources section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Las Bambas Mineral Resources.

3.2.3.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Las Bambas Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resources and Ore Reserves Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	22/10/2019
Rex Berthelsen HonFAusIMM(CP) (#109561)	Date:
This signature was scanned for the exclusive use in this document – the *MMG Mineral Resources and Ore Reserves Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	Douglas Corley Melbourne, VIC
Signature of Witness:	Witness Name and Residence: (e.g. town/suburb)

3.3 Ore Reserves – Las Bambas

3.3.1 Results

The 2019 Las Bambas Ore Reserves are summarised in Table 5. All data reported here is on a 100% asset basis. MMG's attributable interest in Las Bambas is 62.5%.

Table 5 2019 Las Bambas Ore Reserves tonnage and grade (as at 30 June 2019)

Las Bambas Ore Reserves									
						Contained Metal			
Ferrobamba Primary Copper[1]	Tonnes (Mt)	Copper (% Cu)	Silver (g/t Ag)	Gold (g/t Au)	Mo (ppm)	**Copper (kt)**	**Silver (Moz)**	**Gold (Moz)**	**Mo (kt)**
Proved	487	0.59	2.5	0.05	205	2,855	40	0.8	100
Probable	295	0.65	2.9	0.06	172	1,911	27	0.5	51
Total	**783**	**0.61**	**2.7**	**0.05**	**192**	**4,766**	**67**	**1.3**	**151**
Chalcobamba Primary Copper[2]									
Proved	73	0.52	1.7	0.02	161	376	4	0.05	12
Probable	122	0.71	2.7	0.03	128	871	11	0.13	16
Total	**195**	**0.64**	**2.4**	**0.03**	**141**	**1,247**	**15**	**0.18**	**27**
Sulfobamba Primary Copper[3]									
Probable	69	0.73	5.2	0.03	164	506	12	0.1	11
Total	**69**	**0.73**	**5.2**	**0.03**	**164**	**506**	**12**	**0.1**	**11**
Sulphide Stockpiles									
Proved	9.0	0.46	2.3	-	151	41.2	0.66	-	1.35
Total	**9.0**	**0.46**	**2.3**	**-**	**151**	**41.2**	**0.66**	**-**	**1.35**
Total Contained Metal						**6,560**	**94**	**1.6**	**191**

1 0.17% to 0.21% Cu cut-off grade based on rock type and recovery

2 0.20% to 0.25% Cu cut-off grade based on rock type and recovery

3 0.22% to 0.27% Cu cut-off grade based on rock type and recovery

Figures are rounded according to JORC Code guidelines and may show apparent addition errors

Contained metal does not imply recoverable metal

3.3.2 Ore Reserves JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 6 complies with the 2012 JORC Code requirements specified by "Table-1 Section 4" of the Code. Each of the items in this table has been summarised as the basis for the assessment of overall Ore Reserves risk in the table below, with each of the risks related to confidence and/or accuracy of the various inputs into the Ore Reserves qualitatively assessed.

Table 6 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Las Bambas Ore Reserve 2019

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Mineral Resource estimates for conversion to Ore Reserves	• Mineral Resource block models have been updated by Resource Geology within Regional Technical Services (RTS) and reviewed by the Mineral Resource Competent Person. The block models contain descriptions for lithology, Mineral Resources classification, mineralisation, ore type, and other variables described in model release memorandums. The ore loss modifying factors have been incorporated in the block models via a variable. These block models were used for the pit optimisation purpose using corporately approved assumptions for cost and metal prices, GEOVIA Whittle was the software package used for this purpose. (see block model table below) • The Measured and Indicated Mineral Resources quantities are inclusive and not additional to the Ore Reserves reported.
Site visits	• The Competent Person has undertaken numerous site visits to Las Bambas since commercial production commenced. Among other activities, the visits include discussions with relevant people associated with Ore Reserve modifying factors including Geology, Grade Control, Geotechnical, Mine Planning and Mining Operations, Metallurgy, Tailings and Waste Storage, and Environmental Areas. The outcomes from the visits have included reaching a common understanding in those areas, in addition to achieving other specific purposes of each trip. Site visits were also carried out by contributing experts listed in the expert input table at the end of this document.
Study status	• The Las Bambas Ore Reserve estimates were prepared based on Feasibility and Pre-Feasibility level studies that include the following: ○ Bechtel Feasibility Study 2010; and ○ Las Bambas Mine Site 3 TSF Prefeasibility Study, MWH, 2015. • Additional work/studies include: ○ Glencore Mineral Resources and Ore Reserves Report 2013; ○ Audit of Las Bambas Ore Reserves 2013, by Mintec, Inc in October 2013; ○ MMG Competent Person Report prepared by Runge Pincock Minarco (RPM), June 2014;

MR block models	Ferrobamba	Chalcobamba	Sulfobamba
Previously Completed by	Rex Berthelsen	Rex Berthelsen	Anna Lewin / Rex Berthelsen
Updated by	Helber Holguino/Andrew Fowler	Helber Holguino/Andrew Fowler	Helber Holguino/Andrew Fowler
Reviewed by	Rex Berthelsen	Rex Berthelsen	Rex Berthelsen
Memorandum date	4 April 2019	3 June 2019	10 June 2019
Block model file	lb_fe_mor_1902 v2.bmf	lb_ch_mor_1903v2.bmf	lb_sb_1704_mor_v2.bmf
Block size (m)	20 x 20 x 15	20 x 20 x 15	20 x 20 x 15
Model rotation	35°	0°	0°

Section 4 Estimation and Reporting of Ore Reserves

Criteria	Commentary

- MMG Las Bambas cut-Off Grade Report 2019;
  - Rock Mass Model Update by Golder (2017);
  - Structural Geology Mode Update by JFSGC (2017);
  - Hydrogeology Model Update by Itasca (2018);
  - Geotechnical guidance by Piteau (2009-2010);
  - Update and validation of detailed slope engineering for waste dumps 1, Anddes Associates SAC, 2017;
  - Geotechnical work conducted by site personnel and Itasca, 2015 - 2017;
  - 20190711_Memo Ferrobamba Geotechnical Design Guidance for 2019 (Produced by ITASCA 2019 and Las Bambas Geotechnical Personnel)
  - Sulfobamba Metallurgy Testing, 2015;
  - Tailings Storage Facility – Initial review of options to extend filing life, ATCW, 2015;
  - Technical review of future TSF, Khlon Crippen Berger, 2016;
  - Conceptual Development of New Tailings Storage Facility, Ausenco 2017; and
  - TSF2 Conceptual Study, Stantec 2018.
- 2019 Life of Asset (LoA) Reserve Case was produced as part of the MMG planning cycle demonstrates this is technically achievable and economically viable, and that material Modifying Factors have been considered.

Cut-off parameters

- MMG Board approved metal prices for the cut-off calculation have been provided by MMG Group Finance in accordance with the MMG MROR Standard.
- Costs were estimated based on information provided by the Las Bambas Finance Department.
- The breakeven cut-off (BCoG) 2019 has been calculated with updated metal prices and costs and is applied to the copper grade. (Source: 2019 Las Bambas CoG Report).
- Cut-off grade has been determined for each ore-type within each deposit:

Cut-off grades by ore-type for Ferrobamba:

COG Component	Ferrobamba by Ore Type					
	FSSL	FSSM	FPSL	FPSM	FMSL	FBRE
BCOGinpit	0.18%	0.20%	0.17%	0.20%	0.21%	0.19%

Cut-off grades by ore-type for Chalcobamba:

COG Component	Chalcobamba by ORE TYPE						
	CSSL	CSSM	CSML	CSMM	CPSL	CPSM	CBRE
BCOGinpit	0.20%	0.23%	0.20%	0.21%	0.20%	0.25%	0.23%

Cut-off grades by ore-type for Sulfobamba:

COG Component	Sulfobamba by ORE TYPE				
	SSSL	SSSM	SPSL	SPSM	SBRE
BCOGinpit	0.22%	0.27%	0.22%	0.25%	0.23%

Mining factors or assumptions

- The method of Ore Reserves estimation included pit optimisation, final pit and phase designs, consideration of mining schedule and all modifying factors. Addition information is provided in this section.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The mining method selected for the Las Bambas operation is open cut mining, which enables bulk mining of these large low to moderate grade mineral deposits that are outcropping to sub-cropping. Three deposits, Ferrobamba, Chalcobamba and Sulfobamba are each mined in separate open pits. Mining is by way of conventional truck and shovel operation. This method and selected mining equipment are appropriate for these deposits. • The geotechnical recommendations were provided by the Geotechnical & Hydrogeology team at Las Bambas in coordination with MMG Group Technical Services. These recommendations are based on studies performed by site personnel and Itasca (2017 to 2019). The pits are sectored by structural domains and geotechnical sectors. • Altered rock masses were observed during the development of phase 04, therefore two design modifications for phase 04 and 05 were recommended. • Ferrobamba geotechnical slope design angles for 2019 were reported on the memorandum (20190711_Memo Ferrobamba Geotechnical Design Guidance for 2019). The summary table for slope design angles is presented below: **Geotechnical recommendations for Ferrobamba**

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

Design Sector	Level (masl)	Bench height (m)	Berm Face Angle (BFA)	Berm Width (m)	Interramp angle (degrees)	Interamp height (m)	Decoupling Berm width (m)
SW1 SW2 SO1 (PF1)	Below 3720mRL	15	65	9.7	42	120	25
SO2 (PF2)	Below 3675mRL	15	70	10.1	44	120	25
	Below 3720mRL	30	70	13.4	51	120	25
NW (PF3)	4080-3900	15	80	14	42	150	25
	Below 3900	30	70	13.4	51		30
W1 (PF3)	4140 - 3975	15	80	14	42		25
	Below 3975mRL	30	70	13.4	51		30
	Below Ramp, 02 single benches are maintained with IRA : 45°, BFA : 70° and CB:10.0 m						
W2 (PF3)	4140 - 3720	15	70	9.6	45	105-120	25
SE	4095 - 3750	15	70	11.2	42	150	25
	Below 3750	30	70	13.4	51		30
NE (P5)	•	15	65	11	40	150	25
NW (P5)	•	15	70	9	47	150	25
NW (FP)	•	30		12	53		30
W1 (P5)	•	15	70	9	47	150	25
W1 (FP)	•	30		12	53		30
W2 (P5)	•	15	70	9	47	105	25
W2 (FP)	•						
CE (P5)	•	30	70	12	53	150	30
SE (FP)	•	15	70	9	47	150	25
SE (P5/FP)	•	30		12	53		30
SW FP	•	30	70	13	51	150	30
SW FP	•	15		9	47		25
E (P5)	•	15	70	9	47	150	25
E (FP)	•					105	
N NE1 and NE2 (PF6)	3900-3870 Below 3975	30	70	15	49.2	210	35
NW1 and NW2 (PF7)	3960-3870 Below 3975	30	70	15	49.2	210	35

Geotechnical recommendations for Chalcobamba:

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

Sector	Level (m)	BFA (°)	H (BFA)	Catch Bench	IRA (°)	Height Zone (m)	Decoupling Height	Decoupling Width	Decoupling Number	Angle By Zone	Angle +decoupling	OA (°)	Total Height (m)	Bench (number)
CH-S2	4330-4450	70	15	8	48.1	120	90	35	1	45.7	**50.3**	44.1	210	8
	4450-4540	65	15	8	45	90				42.1	**47.7**			6
CH-SE	4255-4465	70	15	8	48.1	210	90	35	1	46.7	**49.3**	45.2	300	14
	4465-4555	65	15	8	45	90				42.1	**47.7**			6
CH-E	4165-4435	70	15	8	48.1	270	105	35	2	44.1	**45.9**	43.6	375	18
	4435-4540	65	15	8	45	105				42.5	**47.3**			7
CH-N	4165-4360	70	15	8	48.1	195	105	35	1	46.6	**49.4**	45.1	300	13
	4360-4465	65	15	8	45	105				42.5	**47.3**			7
CH-NW	4165-4285	70	15	8	48.1	120	90	35	1	45.7	**50.3**	44.1	210	8
	4285-4375	65	15	8	45	90				42.1	**47.7**			6
CH-W	4165-4330	70	15	8	48.1	165	90	35	1	46.3	**49.7**	44.8	255	11
	4330-4420	65	15	8	45	90				42.1	**47.7**			6
CH-SW	4315-4435	70	15	8	48.1	120	90	35	1	45.7	**50.3**	44.1	210	8
	4435-4525	65	15	8	45	90				42.1	**47.7**			6
CH-S1	4315-4450	70	15	8	48.1	135	90	35	1	45.9	**50.0**	44.4	225	9
	4450-4540	65	15	8	45	90				42.1	**47.7**			6

Geotechnical recommendations for Sulfobamba

Sector	Zone	C_Lito	Level (m)	BFA (°)	H (BFA)	Catch bench	IRA (°)	Height Zone (m)	Decoupling Height	Decoupling Width	Decoupling Number	Angle by zone	OA (°)	Total Height (m)	Bench (number)
SU-S	Sup.	71	4565 - 4475	65	15	8	42	90	150	35	1	**38**	41	255	6
	Inf.	40, 47	4475 - 4310	70	15	8	45	165				**42**			11
SU-E	Sup.	71	4565 - 4445	65	15	8	42	120	150	35	1	**38**	42	255	8
	Inf.	40, 47	4445 - 4310	70	15	8	45	135				**42**			9
SU-NE	Sup.	71	4420 - 4345	65	15	8	42	165	150	35	1	**38**	42	255	11
	Inf.	40	4345 - 4165	70	15	8	45	90				**42**			6
SU-N	Sup.	81	4460 - 4310	65	15	8	44	150	150			**45**	45	150	10
SU-W	Sup.	40	4565 - 4505	65	15	8	42	60	150	35	1	**38**	41	195	4
	Inf.	80, 81	4505 - 4370	70	15	8	44	135				**41**			9

- A program of additional geotechnical data collection and analysis is currently being planned for 2020 for Ferrobamba and Chalcobamba and for 2021 in Sulfobamba. This will improve confidence in the slope design guidance at these deposits. The bulk of the findings from the data collection and analysis will be available for inclusion in the 2021 Ore Reserve slope design guidance.
- The 2019 Mineral Resources models for Ferrobamba and Chalcobamba, which incorporated the additional ore loss variable, have been used for the updated 2019 Ore Reserves. The Mineral Resources model for Sulfobamba remained the same as 2018 except the addition of the ore loss variable. All models were regularised to 20m x 20m x 15m.
- The pit optimisation was developed for the three open pits based on the 2019 Mineral Resource block models. The strategy for the final pit selection was based on the NPV by pit shell at revenue factor (RF) 1. Final pit designs that incorporate more practical mining considerations were carried out using those optimisation shells.
- Dilution has been accounted for in the regularised block model used for the Ore Reserves estimate. In addition, the ore loss variable has been populated with following modifying factors:
    - 10% ore loss for the Mixed ore type for all pits.
    - 3% ore loss for all other remaining ore types for all pits.
    - An additional 2% ore loss for Ferrobamba Phase 02, Phase 03 and Phase 04 which are the main ore sources for 2020 and 2021.
- The reconciliation results summarised in the Mineral Resource section earlier was repeated below:

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

	Block Model	Factor	Grade	Tonnes	Metal
Year to June 2018	2018	F1	1.09	0.88	0.96
		F2	0.95	0.95	0.91
		F3	1.04	0.84	0.88
1 July 2017 to 30 June 2018	2019	F1	1.12	0.91	1.02
		F2	0.91	0.97	0.89
		F3	1.02	0.88	0.90
1 July 2018 to 30 June 2019	2019	F1	1.07	0.88	0.94
		F2	0.98	0.94	0.92
		F3	1.04	0.83	0.86
All (since commercial production start)	2019	F1	1.12	0.92	1.02
		F2	0.96	0.94	0.90
		F3	1.07	0.86	0.92

F1 Ore Control / Ore Reserve
F2 Mill / Ore Control
F3 Mill / Ore Reserve

Note the 3% Assay correction for the Mill (applied in 2018) has been removed.

- The reconciliation result has indicated that there could be up to 8% variance between metal contained in Ore Reserve model and metal contained in mill feed that is attributable to ore loss in the mining process. This loss is due to a range of factors including high powder factors, limited mining fronts, the associated need to blast ore and waste together and blast movement. A program to address these issues was set and significant progresses have been made in the areas of blasting practices/designs, monitoring blast movement, accurate positioning of shovels, better design of ore polygons and other remediations. However, some of the programs such as monitoring blast movement and better design of ore polygons are still in progress and yet to be put into mining operation practices.
- In April 2019, Wood PLC was engaged to review the reconciliation history. A key member of the review team was Dr Harry Parker.
- Given these findings, in early June 2019, Las Bambas convened technical stakeholders to develop and agree to a scheme to apply a modifying mining factor to support construction of mine plans more closely aligned with reconciliation outcomes.
- These modifying factors were introduced to the Resources Models under the additional ore_loss variable. The Competent Person considers these Modifying Factors appropriate for 2019 Ore Reserve estimation based on the current information.
- Additional studies for mining dilution and recovery will be undertaken when more reconciliation data is available and the current improvement programs are being implemented in the mining operation.
- Since commercial production commenced, the Ore Reserve has remained well within the acceptable estimation tolerance of +/- 15% for Proven Ore Reserve over a single quarter.
- In the pit, the minimum mining width is 70m; the Small Mining Unit (SMU) has been set at 20m x 20m x 15m.
- Inferred Mineral Resource material has not been included in the pit optimisation or in the Ore Reserves estimates.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The main mining infrastructure includes; crusher, overland conveyor, tailings and waste storage facilities, stockpiles, roadways/ramps, workshops and so forth. • All infrastructure requirements are established for Ferrobamba. Further capital investment is required for infrastructure to support the needs of Chalcobamba and Sulfobamba. • The required infrastructure for Chalcobamba pit has been identified and included in the current approved Environment Impact Assessment (EIA), with 50% of the north waste dump not located within the property boundary. Another location that is fully within the property boundary has been identified and used in the LoA planning; however, it is yet to be evaluated by environmental/legal/exploration teams. In 3rd EIA amendment approval drilling for studies has been included and the 4th EIA amendment will include principal components for Chalcobamba (crushing and conveyor), with waste dump fully within the property boundary. • The planned Sulfobamba infrastructure has been identified within the Las Bambas mining concession, however the infrastructure and deposit are not located within the area of MMG land ownership.
Metallurgical factors or assumptions	• Metallurgical copper concentration process comprises the following activities; crushing, grinding and flotation, producing copper and molybdenum concentrates. Copper concentrates contain gold and silver as by-products. Las Bambas Project commenced commercial production on 1 July 2016. • Extensive comminution and flotation test work has been conducted and metallurgical recoveries determined for different rock types and different mining areas. • Bulk samples and pilot scale tests have been conducted on representative samples of the deposits. For the Ferrobamba deposit, nearly all of the tests were completed by the G&T laboratory in Canada as part of Feasibility Study, though a small number of additional confirmatory tests were included from more recent testing by ALS in Peru. For Chalcobamba, all of the tests were completed by G&T and reported in the Feasibility Study. For Sulfobamba, the data analysed were those from testing at G&T in 2015. • Arsenic minerals identified in the orebody are being mapped and monitored in the mining process. The level of Arsenic in Las Bambas concentrates remains low by market standards and concentrate quality continues to be very acceptable for processing by smelters internationally. • The recovery equations have been provided by the Metallurgical Group at Las Bambas in coordination with MMG Group Technical Services. • The equations were generated based on metallurgical test work, from diamond drilling sample data in each pit. It should be noted that the copper recovery is a function of the ratio of acid soluble copper (CuAS) to total copper (Cu), which is a determining factor for the recovery. The copper recovery is determined by the following equations. All assumptions are validated annually with plant performance data. ***Ferrobamba:*** For all the materials except marble:

<table>
<tr><th colspan="2">Section 4 Estimation and Reporting of Ore Reserves</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td></td><td>
Cu Recovery (%) = (96.0-94.0*(CuAS/Cu) + 1.0
For marble:
Cu Recovery (%) = (96.0-94.0*(CuAS/Cu) -13 + 1.0
Chalcobamba:
Cu Recovery (%) = 94.4-90.0*(CuAS/Cu) + 1.0
Sulfobamba:
Cu Recovery (%) = 89.2 - 80.4*(CuAS/Cu) + 1.0
An improvement in recovery of 1.0% has been added to account for ongoing metallurgical improvement work since the start of operation.

The recovery of Mo, Ag, Au, has been provided by Metallurgical Group at Las Bambas.

<table>
<tr><th colspan="2">Metal</th><th>Ferrobamba</th><th>Chalcobamba</th><th>Sulfobamba</th></tr>
<tr><td>Mo</td><td>%</td><td>55.5</td><td>55.5</td><td>55.5</td></tr>
<tr><td>Ag</td><td>%</td><td>75.0</td><td>75.0</td><td>75.0</td></tr>
<tr><td>Au</td><td>%</td><td>71.0</td><td>71.0</td><td>71.0</td></tr>
</table>

Benchmarking of data from four other mines in South America has been completed and the recovery algorithms that describe performance at these mines compared with those used for the three Las Bambas deposits. The four other mines were Tintaya, Toquepala, Cerro Verde and Antamina.

</td></tr>
<tr><td>Environmental and Permits</td><td>

The Environmental Impact Study for the Las Bambas Project was approved on 7 March 2011 by the Peruvian Government with directorial resolution Nº073-2011-MEM/AAM.
The construction of the project processing facilities including Tailings Storage Facility at Las Bambas was approved 31 May 2012 by the General Directorate of Mining through Resolution N°178-2012-MEM-DGM/V.
The Mine Closure Plan for the Las Bambas Project was approved 11 June 2013 through Directorial Resolution N°187-2013-MEM-AAM. As per the Peruvian regulatory requirements, an update of the Mine Closure Plan was approved 28 September 2016, through Directorial Resolution N°288-2016-MEM-DGAAM.
A first amendment to the Environmental Impact Study was approved 14 August 2013 through Directorial Resolution N°305-2013-MEM-AAM, whereby amendments to the Capacity of the Chuspiri water reservoir and changes to the environmental monitoring program were approved.
On 26 August 2013 the relocation of the molybdenum circuit (molybdenum plant, filter plant and concentrate storage shed) from the Antapaccay region to the Las Bambas project area was approved by the environmental regulator through Directorial Resolution Nº319-2013-MEM-AAM, after assessment of the technical report showed that the environmental impacts of the proposed changes were not significant.
On 6 November 2013, through Directorial Resolution N°419-2013-MEM-DGM/V, the General Directorate of Mining approved the amendment of the construction

</td></tr>
</table>

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	permit for the processing facilities to allow the construction of the molybdenum circuit at the Las Bambas project area. • Minor changes to the project layout were approved 13 February 2014 through Directorial Resolution N°078-2014-MEM-DGAAM and 26 February 2015, through Directorial Resolution N°113-2015-MEM-DGAAM. • On 17 November 2014, the second modification of the Study of Environmental Impact was approved with Directorial Resolution N° 559-2014-EM/DGAAM, whereby changes to the water management infrastructure and changes in the transport system from concentrate slurry pipeline to bimodal transport (by truck and train) were approved. • A second amendment to the construction permit for processing facilities was approved through Directorial Resolution N°419-2015-MEM-DGM/V to allow changes to the design of the tailings storage facility and changes to the water management system and auxiliary infrastructure. • Environmental approval for minor changes to project layout was approved 1 June 2016 through Directorial Resolution N°177-2016-MEM-DGAAM. • On 6 October 2018, the third amendment to the Environmental Impact Study was approved through Directorial Resolution 00016-2018-SENACE-PE-DEAR, to allow changes to the molybdenum plant, included haul road Ferrobamba to Chalcobamba, impacts and measure management in public transport, other ancillary infrastructure and changes to the environmental management plan. • Environmental changes to include the third ball mill and drilling at Jatun Charqui and others were approved through Directorial Resolution N°00030-2019-SENACE-PE-DEAR. • The permit for starting activities in Chalcobamba was submitted on 19 February 2019 and it is under evaluation by authorities and we expect the approval on 20 July 2020. • The permit to discharge treated water to Ferrobamba River was approved on 16 April 2019 through Directorial Resolution N°057-2019-ANA-DCERH. • Geochemical characterisation studies on waste rock samples were conducted in 2007 and 2009/2010 as part of the Feasibility and Environmental Impact Studies, conclusions from these studies indicate that it should be expected that less than 2% of the waste rock from the Ferrobamba and Chalcobamba pits should be Potentially Acid Forming (PAF). No acid rock drainage from the waste rock dumps from these two pits should be expected. Waste rock samples from Sulfobamba were found to contain higher concentration of sulphur and that 30% to 40% of waste rock could be PAF. • Further geochemical characterisation studies on waste rock and tailings samples are currently underway to support the Environmental Impact Study Modification. • The operation of the Ferrobamba waste rock dump was approved on 29th September 2015 by the General Directorate of Mining through Directorial Resolution N°1780-2015-MEM/DGM. • Currently, Las Bambas has four water use licenses:

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	○ License for underground water obtained with Directorial Resolution 0519-2015-ANA / AAA.XI.PA, for a volume up to 9,460.800 m3 / year. ○ License for non-contact water obtained with Directorial Resolution 0518-2015-ANA / AAA.XI.PA, for a volume up to 933.993 m3 / year. ○ License for contact water obtained with Directorial Resolution 0520-2015-ANA / AAA.XI.PA, for a volume up to 4,730,400 m3 / year. License for contact water obtained with Directorial Resolution 0957-2016-ANA / AAA.XI.PA, for a volume up to 4,730,400 m3 / year. ○ License for fresh water obtained with Directorial Resolution 0778-2016-ANA / AAA.XI.PA, for a volume up to 23,501,664 m3 / year.
Infrastructure	Las Bambas has the following infrastructure established on site: • Concentrator currently in operation. • Based on the current TSF design and the design assumptions for dry settled density and beach angle, the TSF currently under construction at Las Bambas has a final capacity of 784Mt of tailings from processing 800Mt. Three studies have been conducted looking at increasing tailings storage capacity at Las Bambas: ○ Tailings characterization test work to assess final settled density and beach slope in current TSF. ○ Options assessment to increase capacity at TSF currently under construction. ○ Pre-feasibility study for an additional TSF at Tambo valley. • Camp accommodation for staff • Water supply is sufficient for site and processing, sourced from the following: rainfall and runoff into Chuspiri dam, groundwater wells, contact waters, recirculating water in the process plant. Pump station from Challhuahuacho River off-take structure. • Transport of the copper concentrate is performed by trucks, covering 380km, to the Imata Village, then it is transported by train, covering 330km, up to Matarani Port in Arequipa region. Transport of the molybdenum concentrate will be performed by trucks all the way from Las Bambas site to Matarani Port, covering 710Km. This method is also used temporarily for some of the copper concentrate. • There are principal access roads that connect Las Bambas and national routes, Cotabambas to Cusco and Cotabambas to Arequipa. • High voltage electrical power is sourced from the national grid Cotaruse – Las Bambas, with a capacity of 220kV. • The majority of staff working at the operation are from the region immediately surrounding the project. • Technical personnel are mostly sourced from within Peru. The operation has a limited number of expatriate workers. Additional support is provided by MMG office's in Lima and Melbourne Group office personnel. • Chalcobamba pit operation requires additional purchase of land to the North side of the lease (Waste dump 2). However, an alternative location is being evaluated that does not require land purchase; this is what the LoA planning is based on currently. Sulfobamba pit operation requires additional purchase of land for the pit and other infrastructure.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Costs	• Las Bambas Project commenced commercial production on 1 July 2016; future additional capital costs such as TSF 2 expansion are mainly based on pre-feasibility studies, taking into account of additional information now available during three years of operation. The operating costs used for Ore Reserves estimation are based on the 2019 Budget (2019-2021) and 2018 Life of Asset (LoA) (2022 onwards) as per Corporate (MMG) guidelines and other considerations. Specifically: o Average costs are calculated by using the first 3 years budget plus remaining LoA estimated costs year by year; o Necessary adjustments required for the input prices and consumption rates, updated during the budget process, are made to establish connection between the budget and LoA; and o Approved cost savings from identified initiatives and improvements to be delivered over the life of mine are incorporated. • No deleterious elements are expected in the concentrates that would result in smelter penalties. • Metal prices and exchange rates are the same as those reported in the section for cut-off grade parameters. These Board approved prices and rates are provided by MMG Corporate and are based on external company broker consensus and internal MMG strategy. • Transportation charges are based on quotations from local companies. • Treatment and refining charges (TC/RC's) are based on marketing actuals and projections. Royalties payable are based on information provided by the Finance and Commercial Group at Las Bambas. • Sustaining capital costs, together with mining costs and processing costs have been included in the pit optimisation. The sustaining capital costs are principally related to TSF construction and equipment replacement. The inclusion or exclusion of these costs in the Ore Reserves estimation process has been done following MMG guidelines according the objective of each capital expenditure in the operation.
Revenue factors	• All mining input parameters are based on the Ore Reserves estimate LoA Reserve Case production schedule. All cost inputs are based on tenders and estimates from contracts in place as with net smelter returns (NSR) and freight charges. These costs are comparable with the regional averages. • The gold and silver revenue is via a refinery credit. • TC/RC's have been included in the revenue calculation for the project.
Market assessment	• MMG considers that the outlook for the copper price over the medium and longer term is positive, supported by further steady demand growth. • Global copper consumption growth will continue to be underpinned by rising consumption in China and the developing countries in Asia as these nations invest in infrastructure such as power grids, commercial and residential property, motor vehicles and transportation networks and consumer appliances such as air conditioners.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• Global copper demand will also rise as efforts are made to reduce greenhouse gas emissions through increased adoption of renewable energy sources for electricity generation and electric vehicles for transportation. • Supply growth is expected to be constrained by a lack of new mine projects ready for development and the requirement for significant investment to maintain existing production levels at some operations. • Las Bambas has life of mine agreements in place with MMG South America and CITIC covering 100% of copper concentrate production which is sold to these parties at arms' length international terms. These agreements ensure ongoing sales of Las Bambas concentrate.
Economic	• The costs are based on the 2019 LoA Reserve Case projections which are based on actual costs and 2019 Budget information. • The financial model of the Ore Reserves mine plan shows that the mine has a substantially positive NPV. The discount rate is in line with MMG's corporate economic assumptions. • Various sensitivity analyses on the key input assumptions were undertaken during mine optimisations and financial modelling. All produce robust positive NPVs.
Social	• Las Bambas project is located in the Apurimac region that has a population of approximately 456,000 inhabitants (Census 2014). The region has a University located in the city of Abancay, with mining programs that provide professionals to the operation. The project straddles two provinces of the Apurimac region, Grau and Cotabambas. • Las Bambas Project contributes to a fund - "FOSBAM" - that promotes activities for the sustainable development of the disadvantaged population within the project's area of influence, comprising the provinces Grau and Cotabambas – Apurimac. • Las Bambas Project and the local community entered into an agreement for the resettlement of the rural community of Fuerabamba, Convenio Marco. The construction the township of Nuevo Fuerabamba was completed in 2014 and the resettlement of all community families were completed in 2016. Currently, in joint work with the community, MMG are executing the commitments described in the framework agreement - Convenio Marco. • During the extraordinary general meeting in January 2010, Fuerabamba community approved the agreements contained in the so-called "compendium of negotiating resettlement agreements between the central negotiating committee of the community of the same name and representatives of Las Bambas mining project" that considers 13 thematic areas. • Las Bambas Project provides important support to the community in the areas of agriculture, livestock and health, education, and other social projects, which is well received. • Las Bambas has had periodic social conflict with communities along the public road used for concentrate transport and logistics. In response to these concerns Las Bambas has promoted a dialogue process in which the government, civil society and communities along the road participate. Besides, Las Bambas is also working to systematically improve the road conditions and reduce the impacts,

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	while also maximising the social development opportunities available to these communities. • Las Bambas, for social management, complies with the national regulations of Peru and applies the Corporate standards of MMG and ICMM.
Other	• Las Bambas owns 7,718Ha of land within the mining project. • The mining concession totals an area of 35,000 hectares, which includes the area containing the three mineral deposits and their corresponding infrastructures. • Only 10% of the concession of Las Bambas has been explored year to date. • According to Directorial Resolution N°187-2013-MEM-DGM/V, dated May 2nd, 2013, the Pit Mining Plan and the waste dump was approved for the Las Bambas project. • Approval for the exploitation of the Ferrobamba pit was granted on 30th September 2015 through Directorial Resolution N° 1780-2015-MEM/DGM. • The title for the Beneficiation Concession and approval for the operation of the concentrator plant was granted on November 30th, 2015 through Directorial Resolution N° 2536-2015-MEM/DGM. • It is reasonable to expect that the future land acquisition and community issues will be materially resolved, and government approvals will be granted within the required timeframe.
Classification	• The classification of Ore Reserves is based on the requirements set out in the JORC code 2012, based on the classification of Mineral Resources and the cut-off grade. The material classified as Measured and Indicated Mineral Resources within the final pits and is above the breakeven cut-off (BCoG Cu%) grade is classified as Proved and Probable Ore Reserves respectively. • The Competent Person considers this appropriate for the Las Bambas Ore Reserves estimate. • No Probable Ore Reserves have been derived from Measured Mineral Resources.
Audit or Reviews	• The 2014 Ore Reserves were reviewed by Runge Pinock Minarco for the MMG Competent Person's Report. • The 2019 Ore Reserve estimates have been reviewed and validated by Javier E Ponce, Las Bambas Long Term Planning Superintendent. • An external third-party audit was undertaken in 2018 on the 2017 Ore Reserve by AMC Consultants. The audit concluded that the 30 June 2017 Ore Reserve was prepared to an acceptable standard at the time it was completed. The audit also identified some minor improvements to the estimation process and one potentially material issue in the application of mining ore recovery. It states that: "AMC understands there are several projects presently underway to minimise ore loss and dilution. These should be monitored and any residual discrepancy between the Ore Reserve model and the mill claim should be considered in the Ore Reserve process." • The mining ore recovery was discussed in mining factors and assumptions section of this report.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Discussion of relative accuracy/ confidence	• The principal factors that can affect the confidence on the Ore Reserves are: ○ Proved Ore Reserves are considered to have a relative accuracy of +/- 15% within a volume equivalent to 3 months of production while Probable Ore Reserves are considered to have a relative accuracy of +/- 15% within a volume equivalent to 12 months of production. ○ Geotechnical risk related to slope stability (due to uncertainties in the geo-mechanical domains / hydrology models) or excessive rock mass blast damage that could increase the mining rate. ○ Metallurgical recovery model uncertainty due to operational variability. In the best-case scenario, this would represent variability of +/- 2% and in the worst scenario +/- 5% to metal recovery. ○ Increases in rising operating costs for mining and processing. ○ Increase in selling cost due to the transportation (truck and rail) cost increases. ○ Capital costs variation for the new or expansion of current TSF. Also land acquisition and/permitting delays for additional TSF needs. ○ Mining dilution and recovery adjustments as results of future reconciliation studies when more operational data become available. ○ The social-political context impacts the schedule of the approvals of studies and requires good relationship with the communities and an ongoing requirement for investment in delivering on social commitments. ○ Change in environmental legislation, could be more demanding. ○ Current artisanal mining activities at Sulfobamba targeting high -grade mineralisation above the water table and social access may impact the timing of mining this pit due to delay in obtaining permitting and securing surface rights. The ore extracted to date is not expected to be significant in terms of losing ore reserve. It is recognised that the cost of accessing this resource will need to account for some form of economic resettlement for those community members engaged in the artisanal mining activities.

3.3.3 Expert Input Table

A number of persons have contributed key inputs to the Ore Reserves determination. These are listed below in Table 7.

In compiling the Ore Reserves the Competent Person has reviewed the supplied information for reasonableness but has relied on this advice and information to be correct.

Table 7 Contributing experts – Las Bambas Ore Reserves

EXPERT PERSON / COMPANY	AREA OF EXPERTISE
Rex Berthelsen, Group Manager Resource Geology, MMG Ltd (Melbourne)	Mineral Resource models
Amy Lamb, Group Manager Metallurgy, MMG Ltd (Melbourne)	Updated processing parameters and production record
Maximiliano Adrove, Manager Geotechnical and Hydrogeology, MMG Ltd (Las Bambas)	Geotechnical parameters
Jeff Price, Principal Geotechnical Engineering, MMG Ltd (Melbourne)	
Javier E Ponce, Mine Development Planning Superintendent, MMG Ltd (Lima)	Cut-off grade calculations Whittle/MineSight optimisation and pit designs
Jorge Valverde, Technical Services Manager, MMG Ltd (Las Bambas)	Production reconciliation
David Machin, Group Manager Water and Tailings Engineer, MMG Ltd (Melbourne)	Tailings Management
Giovanna Huaney, Manager Environmental Superintendent, MMG Ltd (Las Bambas)	Environmental/Social/Permitting
Oscar Zamalloa, Business Evaluation Manager, MMG Ltd (Lima)	Economics Assumptions
Steve Whitehead, General Manager Marketing, MMG Ltd (Melbourne)	Marketing

3.3.4 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Ore Reserve statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

3.3.4.1 Competent Person Statement

I, Yao Wu, confirm that I am the Competent Person for the Las Bambas Ore Reserve section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australasian Institute of Mining and Metallurgy and hold Chartered Professional accreditation in the field of Mining.
- I have reviewed the relevant Las Bambas Ore Reserve section of this Report to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Las Bambas Ore Reserve section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Las Bambas Ore Reserves.

3.3.4.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Las Bambas Ore Reserves - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Yao Wu MAusIMM(CP)(#108391)

22/10/2019

Date:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Signature of Witness:

Kim Kirkland
Lima, Peru

Witness Name and Residence: (e.g. town/suburb)

4 KINSEVERE OPERATION

4.1 Introduction and setting

Kinsevere is located in the Katanga Province, in the southeast of the Democratic Republic of Congo (DRC). It is situated approximately 27 kilometres north of the provincial capital, Lubumbashi (Figure 4-1), at latitude S 11° 21’ 30” and longitude E 27° 34’ 00”.

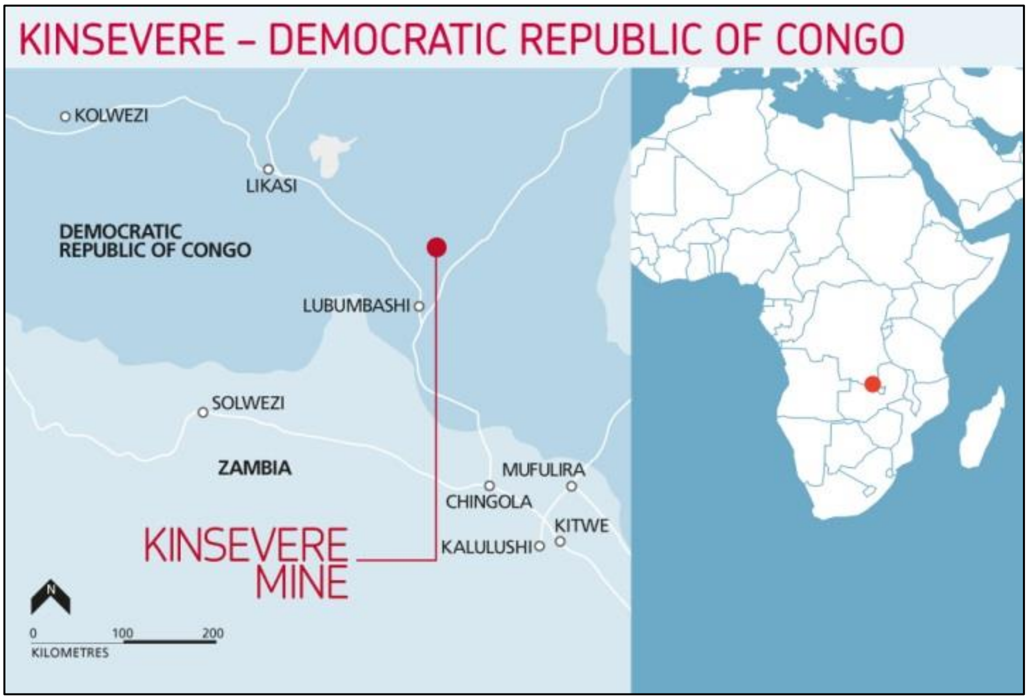


Figure 4-1 Kinsevere Mine location

Kinsevere is a conventional truck and excavator operation with atmospheric leaching of the oxide ore using a solvent extraction electro-winning (SX-EW) plant. The mine was started in 2006 using heavy media separation (HMS) and an electric arc furnace operation. The electric arc furnace was put on care and maintenance in 2008 with HMS then producing a direct shipping ore product grading 25% copper. The HMS was decommissioned in June 2011 when the Stage II SXEW plant was commissioned.

4.1.1 Results

The 2019 Kinsevere Mineral Resource are summarised in Table 8. The Kinsevere oxide Mineral Resource is inclusive of the Ore Reserve.

The reporting cut-off grade applied to the model is 0.6% acid soluble copper (CuAS%) for the oxide Mineral Resource, 0.7% total copper (Cu%) for the transitional mixed (TMO) Mineral Resource and 0.8% total copper (Cu%) for the primary sulphide Mineral Resource. The TMO material is defined as having a Ratio (CuAS%/Cu%) greater than or equal to 0.3 and less than 0.5. The Kinsevere Cobalt (Co%) Mineral Resource is external to the Kinsevere Cu% Mineral Resource.

Table 8 2019 Kinsevere Mineral Resource tonnage and grade (as at 30 June 2019)

Kinsevere Mineral Resource							
					Contained Metal		
Oxide Copper[2]	Tonnes (Mt)	Copper (% Cu)	Copper (AS[1] % Cu)	Cobalt (% Co)	Copper ('000)	Copper AS[1] ('000)	Cobalt ('000)
Measured	1.4	4.2	3.6	0.2	60	51	2.5
Indicated	7.2	3.3	2.8	0.1	237	205	5.9
Inferred	0.9	2.4	2.1	0.1	21	18	0.8
Total	**9.5**	**3.3**	**2.9**	**0.1**	**317**	**274**	**9.2**
Transition Mixed Ore (TMO) Copper[3]							
Measured	0.5	2.5	1.0	0.2	12	5	1.0
Indicated	2.0	2.0	0.9	0.1	40	17	2.9
Inferred	0.3	1.9	0.8	0.1	6	2	0.3
Total	**2.8**	**2.1**	**0.9**	**0.2**	**58**	**25**	**4.2**
Primary Copper[4]							
Measured	1.2	2.8	0.4	0.3	34	5	3.5
Indicated	19.5	2.3	0.2	0.1	446	34	25.2
Inferred	2.4	1.9	0.2	0.1	47	4	2.9
Total	**23.2**	**2.3**	**0.2**	**0.1**	**528**	**43**	**31.5**
Stockpiles							
Indicated	12.9	1.8	1.2		230	156	
Total	**12.9**	**1.8**	**1.2**		**230**	**156**	
Kinsevere Copper Total	**48.4**	**2.3**	**1.0**	**0.1**	**1,133**	**498**	**44.9**
Oxide-TMO Cobalt[5]							
Measured	0.03			0.6			0.2
Indicated	0.3			0.6			1.5
Inferred	0.1			0.6			0.7
Total	**0.4**			**0.6**			**2.4**
Primary Cobalt[6]							
Measured	0.01			0.3			0.03
Indicated	0.2			0.3			0.6
Inferred	0.1			0.3			0.3
Total	**0.3**			**0.3**			**1.0**
Kinsevere Cobalt Total	**0.7**			**0.5**			**3.4**

[1] AS stands for Acid Soluble
[2] 0.6% Acid soluble Cu cut-off grade
[3] 0.7% Total Cu cut-off grade
[4] 0.8% Total Cu cut-off grade
[5] 0.4% Co cut-off grade
[6] 0.2% Co cut-off grade
All Mineral Resources except stockpiles are contained within a US$3.64/lb Cu pit shell
Contained metal does not imply recoverable metal.
Figures are rounded according to JORC Code guidelines and may show apparent addition errors.

4.1.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 9 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 9 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Kinsevere Mineral Resource 2019

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sampling techniques	• The Mineral Resource uses a combination of reverse circulation (RC) drilling diamond drilling (DD). The RC drilling is predominately collected for grade control and the DD is used for exploration and resource delineation work. • DD core is sampled mostly as 1m intervals while samples in un-mineralised zones are sampled over 4m lengths. Sampling is predominantly performed by cutting half core, with half retained on site for future reference. For PQ drilling undertaken 2015-2019, quarter core was submitted for sampling. • Grade control drilling (RC) is composited into 2m samples collected after riffle splitting. • Each sample is crushed and pulverised to produce a pulp (>85% passing 75µm) prior to analysis at the site SGS laboratory. • Measures taken to ensure sample representivity include orientation of the drill holes as close as practical to perpendicular to the known mineralised structure. In addition field duplicates have been taken and analysed. • The sample types, nature, quality and sample preparation techniques are considered appropriate for the style of the Kinsevere mineralisation (sediment hosted base metal) by the Competent Person.
Drilling techniques	• RC drilling was used to obtain 2m composited RC chip samples. 364,046m or 77% of the sample data used in the Mineral Resource were from RC samples (5.5 inch hammer), of that 263,388m (72%) was from Grade Control drilling. • PQ and HQ sized DD core were used to obtain nominal 1m sample lengths. 2015-2019 DD core was not routinely oriented. 97,183m or 21% of the sample data used in the Mineral Resource were from DD samples. • 51,748m of RC Grade Control drilling and 9,966 of RC drilling was completed since the 2018 estimation and utilised in the 2019 estimate. • 5,765m of DD drilling was completed since the 2018 estimation and utilised in the 2019 estimate. The drilling is dominantly PQ with minor HQ. The recent DD drilling (2018/2019) was drilled to inform a Scoping and PFS Sulphide Study and testing geological continuity in the south of Kinsevere deposit. • In the view of the Competent Person sampling is of a reasonable quality to estimate the Mineral Resource.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Drill sample recovery	• DD core recovery recorded was typically above 90%, with only minor losses in competent ground (recovery average 97.3% for all drilling, and over 98.7% within ore zones). As expected, the recovery fell in unconsolidated ground such as weathered material close to surface and in vuggy zones of dolomitic rocks (average recovery approximately 85%, in this area). The vuggy zones are generally controlled by major structures. Triple tube core barrels were used to maximize core recovery. DD core recovery and run depth are verified and checked by a geological technician at the drill site. This data is recorded and imported in the database. • RC drilling has been observed for sample recovery with adequate sample volume being returned. However, no quantitative measurements of recovery have been recorded. • There is no observed relationship between core loss and mineralisation or grade - no preferential bias has occurred due to any core loss.
Logging	• RC chips are logged by geologists directly into an Excel logging template, geological information captured includes: lithology, stratigraphy, weathering, oxidation, colour, texture, grain size, mineralogy and alteration. This data is then imported into the database. For DD core samples both geological and geotechnical information is logged. (lithology, stratigraphy, mineralisation, weathering, alteration, geotechnical parameters: strength, RQD, structure measurement, roughness and infill material) • All RC chip and DD core samples (100%) have been geologically logged to a level that can support appropriate Mineral Resource estimation. • Logging captures both qualitative descriptions such as geological details (e.g. rock type, stratigraphy) with some quantitative data (e.g. ore mineral percentages). Core photography is not known to have occurred prior to MMG ownership (2012). Since MMG took control of the site all DD core is photographed. • The total length and percentage of the relevant intersections logged is 100%.
Sub-sampling techniques and sample preparation	• DD core was split in half (NQ) or quartered (PQ) using a diamond saw. Sample lengths were cut as close to 1m as possible while also respecting geological contacts. Samples were generally 2kg to 3kg in weight. • RC samples are collected from a cyclone by a trained driller's assistant. If the sample was dry the sample was passed through a riffle splitter and collected into a pre-numbered calico bag. Residual material was sampled and sieved for collection into chip trays for logging and the remainder returned to the larger poly-weave bag. The splitter was cleaned using compressed air or a clean brush and tapped using a rubber mallet. If the sample was wet, then the sample was dried in the laboratory oven before being split according to the procedure above (for dry samples). • Samples from individual drill holes were sent in the same dispatch to the preparation laboratory. • Representivity of samples was checked by sizing analysis and duplication at the crush stage.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• Field duplicates were inserted at a rate of approximately 7% to ensure that the sampling was representative of the in-situ material collected. Field duplicates in current RC programs have shown acceptable levels of repeatability across all elements analysed. • These practices are industry standard and are appropriate for the grain size of the material being sampled. • RC Grade Control samples are prepared on-site by the geology department, who provide pulp samples to the SGS analytical facility also on site at Kinsevere. The samples were oven dried at approximately 80°C, crushed to 85% passing -2mm using a jaw crusher and milled to 85% passing 75µm using one of three single sample LM2 vibratory pulverising mills. • Since 2015, Exploration and near-mine DD drilling core and RC chips are processed at the onsite Exploration core yard. Sample preparation was conducted at this facility through an ALS managed Containerised Preparation Laboratory (CPL). Pulp samples where then sent to ALS Johannesburg for analysis. • The sample size for both RC and DD is considered appropriate for the grain size of the material being sampled.

Quality of assay data and laboratory tests	• RC ore control samples are currently assayed at the onsite SGS Laboratory.
	  ○ Following preparation, 50g pulp samples are routinely analysed for total and acid soluble copper, cobalt and manganese.
	  ○ A 3 acid digest with AAS finish was used to analyse for total values.
	  ○ A sulphuric acid digest with AAS finish was used to analyse for acid soluble copper.
	• All DD core samples prior to 2011 were assayed at:
	  ○ ALS Chemex Laboratory, Johannesburg
	  ○ McPhar Laboratory, Philippines
	  ○ ACTLabs Laboratory, Perth
	  ○ Samples were analysed for total copper and acid soluble copper with some having a full suite of elements analysed with a four acid digest and ICP-OES analysis.
	• From 2011, prepared samples were submitted to the ISO 17025 accredited SGS Laboratory in Johannesburg with the following assay scheme:
	  ○ ICP-OES method with a 4-acid digest analysing 32 elements including copper from 0.5ppm to 1%.
	  ○ ICP-OES method using alkali fusion is applied to over-range copper results.
	  ○ ICP-AES with a 4-acid digest was used for calcium and sulphur analysis
	  ○ XRF was used for uranium analysis.
	  ○ Acid soluble copper using a sulphuric acid digest and AAS finish.
	• For 2015 to 2017 DD drilling, prepared samples were submitted to the ALS Laboratory in Johannesburg with the following assay scheme:
	  ○ ICP-OES (ME-ICP61) method with a 4-acid digest analysing 33 elements plus OG triggers when Cu greater than 1% (OG62)

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	○ LECO analysed Total Carbon (C-IR07), Organic Carbon (C-IR17), Total Sulphur (S-IR08) and Sulphide Sulphur (S-IR07) ○ Acid soluble copper using a Sequential Leach (Cu-PKGPH06) finish. • No geophysical tools, spectrometers or handheld XRF instruments have been used in the analysis of samples external to the ALS laboratory for the estimation of Mineral Resources. • QAQC employs the insertion of Certified Reference Material (CRM) every 25 samples; blanks, field duplicates, coarse duplicates and pulp duplicates are taken/ inserted within every batch of 50 samples; and umpire laboratory checks are submitted for every batch of 20 samples to check accuracy, precision and repeatability of the assay result. Acceptable levels of accuracy and precision have been established. If control samples do not meet an acceptable level the entire batch is re-analysed. • The analysis methods described above are appropriate for the style and type of mineralisation.
Verification of sampling and assaying	• Significant intersections are verified by alternate company personnel following receipt of assay results and during the geological modelling process. • Twinned pre-collars are present in the database. These were used to confirm and check geological intervals and/or assay intervals. Twin drill holes are not used in the Mineral Resource. • Data is collected in Excel spread sheets and imported into industry standard databases that have built in validation systems and QAQC reporting systems. Raw data is imported in the database as received by the laboratory. • Where data was deemed invalid or unverifiable it was excluded from the Mineral Resource estimation. • There are no adjustments to the assay data.
Location of data points	• Prior to 2011 all drill hole collars were located using a hand held GPS. Accuracy of GPS is +/- 5m for x and y coordinates and has poor accuracy of the z (elevation) coordinates. Elevations of these holes were later adjusted by using a LIDAR survey method. • RC and DD holes collared post-2011 are surveyed by qualified surveyors. Down hole surveys have been carried out using Eastman single-shot cameras or Reflex EZ tools. Surveys are taken at variable intervals and stored in the database. • Coordinates are in Kinsevere Mine Grid, which is related to WGS84 by the following translation: -8000000 m in northing and -22.3 m in elevation. • A LIDAR survey was used to generate a topographic surface. This surface was also used to better define the elevation of drill hole collars. The LIDAR survey is considered to be of high quality and accuracy for topographic control.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Data spacing and distribution	• Majority of the Grade control RC drill pattern spacing is 5m x 15m, however in 2018 Grade control RC drill pattern spacing was 10m x 10m and it has been revised back to spacing 5m x 15m in 2019 which is enough to adequately define lithology and mineralisation domain contacts and transition zones. • The overall DD pattern spacing is between 25m and 75m, which is sufficient to establish the required degree of geological and grade continuity that is appropriate for the Mineral Resource. Between 2015 and 2019, diamond drilling aimed to infill target areas to 40m x 40m spacing and down to 20m x 20m in places. • DD samples are not composited prior to being sent to the laboratory however the nominal sample length is generally 1m. RC samples are 2m intervals but compositing up to 4m has occurred in the past.
Orientation of data in relation to geological structure	• The mineralisation strikes between north and north-west at Mashi / Central pits, and to, the east south east at Kinsevere Hill. All drill holes are oriented such that drill holes have a high angle of intersection with the dominant strike and dip of bedding and structures, with the local scale of mineralisation also considered. All drill holes are either oriented east or west with dips of 60° to sub-vertical. • The combination of both east and west orientations likely minimises sampling bias, which, if present, is not considered material.
Sample security	• Measures to provide sample security include: ○ Adequately trained and supervised sampling personnel. ○ Sea containers used for the storage of samples are kept locked with keys held by the security department. ○ Assay laboratory checks of sample dispatch numbers against submission documents.
Audit and reviews	• An independent of the Mineral Resource model was completed in August 2019, by AMC consultant Pty Ltd as a part in reviewing of the 2019 Mineral Resource for the Central and Mashi areas of the Kinsevere copper deposit. The 2019 Mineral Resource model is a reasonable global model and no material errors were found. • Internal visits by the Competent Person and MMG Group Office geologists to the site laboratory, sample preparation area and drill locations are undertaken at least annually. These inspections have not identified any material risks.

Section 2 Reporting of Exploration Results

<table>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td>Mineral tenement and land tenure status</td><td>

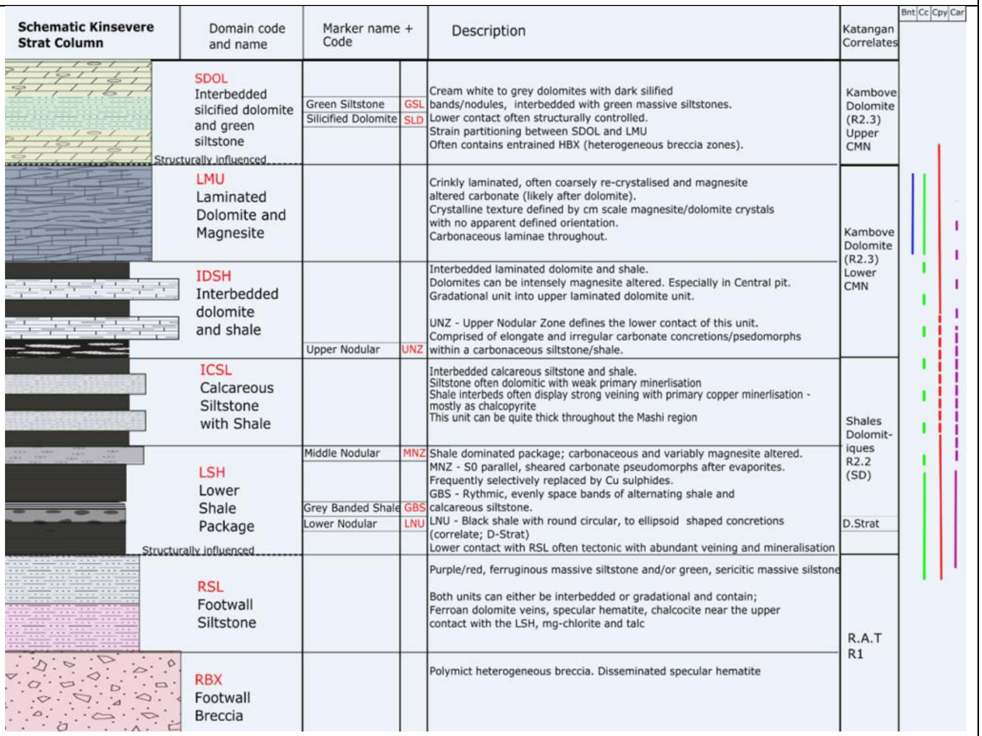
The Kinsevere Mining Licence (PE 528) is located approximately 27 km north of Lubumbashi, the provincial capital of the Katanga Province, in the southeast of the Democratic Republic of the Congo (DRC). The PE 528 permit covers the three major deposits of Tshifufiamashi, Tshifufia and Kinsevere Hill/Kilongo
MMG has a Contrat d’Amodiation (Lease Agreement) with Gécamines to mine and process ore from the Kinsevere Project until 2024. A renewal application process for 15 year extension shall be submitted to DRC regulatory at least 1 year and no more than 5 years before the expiry date.
A Contrat d’Amodiation is provided for under the DRC Mining Code, enacted by law No 007/2002 of July 11, 2002.
A conversion of the adjacent PR7274 to an exploitation permit was completed in 2018. Tenement amalgamation (of PE528 and PE7274) was completed in early March 2019, with PE7274 incorporated into PE528.
There are no known impediments to operating in the area.

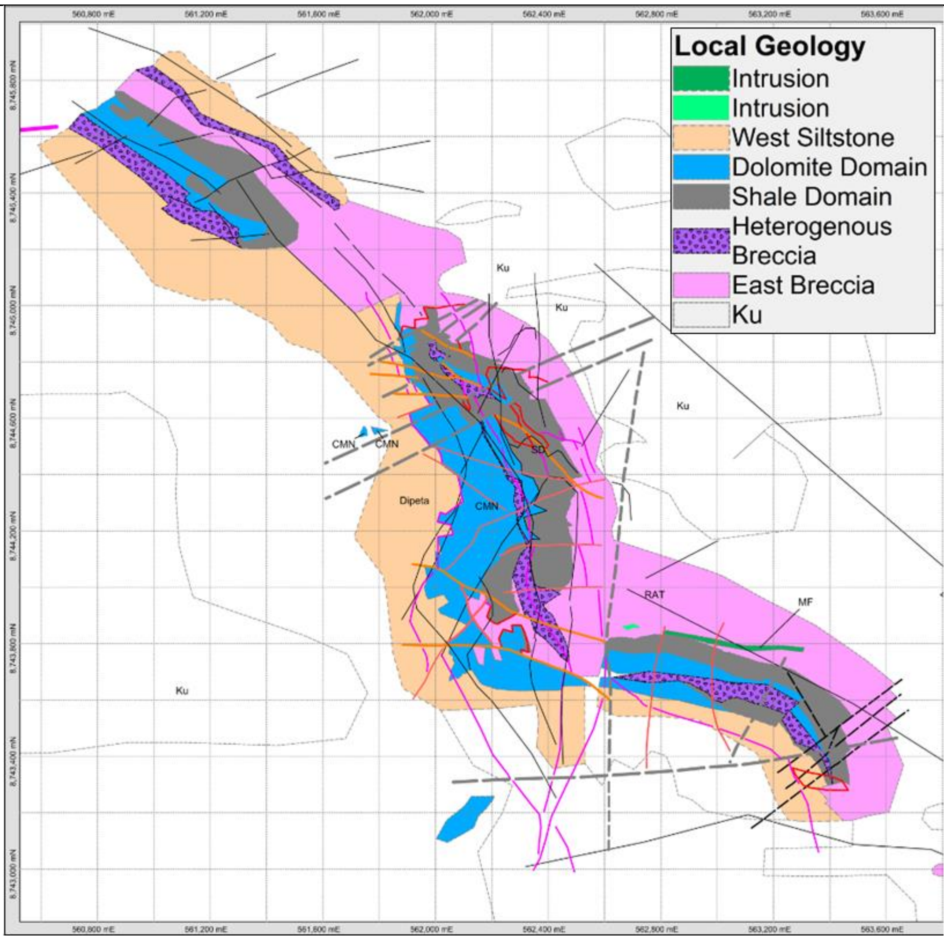
</td></tr>
<tr><td>Exploration done by other parties</td><td>
Summary of Previous Exploration Work by Gecamines and EXACO
<table>
<tr><th rowspan="2">Deposit</th><th>Pitting</th><th colspan="2">Trenching</th><th colspan="2">Drilling</th></tr>
<tr><th>No
(m depth)</th><th>No.
(metres)</th><th>Significant Grades</th><th>No. holes
(metres)</th><th>Significant Grades</th></tr>
<tr><td>Tshifufiamashi</td><td>11</td><td>16
(1,304 m)</td><td>5.8% Cu
0.2% Co
over 50 m</td><td>37
(846 m)</td><td>10.5% Cu
0.72% Co
over 22.2 m</td></tr>
<tr><td>Tshifufia Central</td><td>-</td><td>17
(1,106 m)</td><td>7.6% Cu
0.3% Co
over 15 m</td><td>19
(950 m)</td><td>6.3% Cu
0.6% Co
over 23 m</td></tr>
<tr><td>Tshifufia South</td><td>-</td><td>39
(278 m)</td><td>7.2% Cu
0.3% Co
over 40 m</td><td>11
(497 m)</td><td></td></tr>
<tr><td>Kinsevere Hill</td><td>7
(44 m max.)</td><td>11
(625 m)</td><td>6.6% Cu
0.2% Co
over 20 m</td><td>10
(1,021 m)</td><td>3.99% Cu
0.22% Co
over 14.6 m</td></tr>
</table>

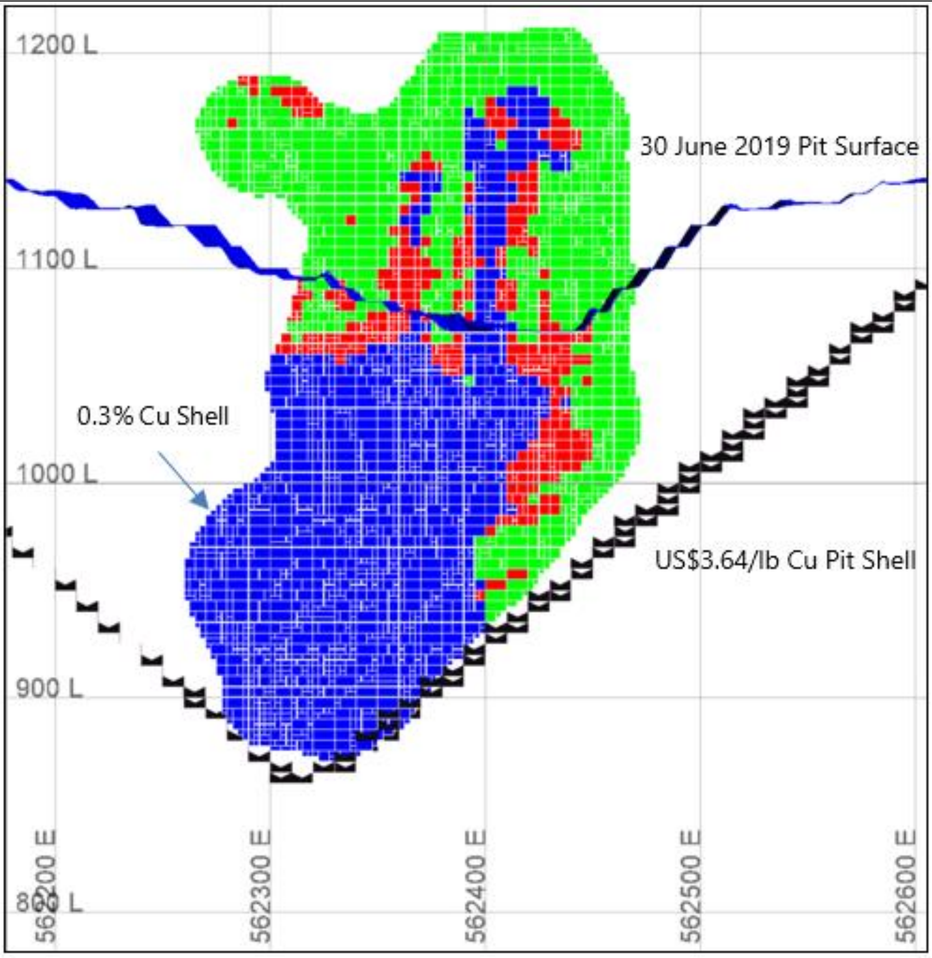
In 2004 Anvil Mining carried out intensive exploration drilling to define the deposits in Kinsevere.
In 2012 MMG continued exploration aimed at identifying additional mineralisation beyond the Anvil Mining Mineral Resource.
In 2013/2014 MMG Exploration have been conducting works around the Mine Lease within a 50 km radius of the known deposit to explore for additional high-grade oxide material.
In 2015 MMG conducted a Scoping Study on the potential to process the copper sulphide ore at Kinsevere located beneath the current oxide Ore Reserves. As part of this study, 5 DD holes were drilled in early 2015. In August 2015, DD drilling re-commenced as part of a follow on Pre-Feasibility Study to increase confidence in the copper sulphide Mineral Resource. This drilling was completed at the end of 2016 and included in the 2017 Resource Estimate.

</td></tr>
</table>

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	• Drilling commenced in May 2017 to inform the Sulphide Feasibility Study. This drilling was used to update the previous 2018 Mineral Resource model. • Drilling commenced in Jan 2018 to testing the link of geological continuity between Mashi and Central Pit which is completed in September 2018 then continue latest 2018 drilling in the south of Kinsevere Hill (south of Kinsevere copper deposit), this drilling is testing the copper grade mineralisation at depth. These two drilling programs were used to update the 2019 Mineral Resource model.
Geology	• The Kinsevere Copper deposit is a sedimentary hosted copper deposit. The deposit is hosted in moderately to steeply dipping Neoproterozoic sedimentary formation of the Roan group of the Katanga stratigraphy in the Mine Series subgroup of Katangan African Copper belt. • On surface, the Kinsevere Copper deposit has been mapped as made of three separate Mine Series fragments (large breccia clasts of the Mine Series) whereby the first two fragments are situated along a major N-S oriented fracture and separated by a sinistral strike-slip fault, while the third fragment, called Kinsevere Hill, is situated along major NW-SE fracture and separated from the other fragments by another sinistral strike-slip fault. All these fragments are affected by fractures and breccias. • The sulphide, transitional and oxide mineralisation in the Kinsevere copper deposit are either disseminated in recrystallised layers or infilling bedding plans, reactivated bedding, fractures and joints. Sulphide mineralisation includes chalcopyrite, bornite, chalcocite and pyrite. Oxide mineralization is dominated by malachite with lesser chrysocolla. A transitional zone exists between the primary and oxide zones with both a horizontal trend, controlled by ground water movements, and a sub vertical trend controlled by bedding and structures. Transitional copper species include chalcocite, cuprite, covellite and native copper. This zone is known as the TMO (transitional/mixed ore) zone.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	 **Kinsevere Mine Series Stratigraphy**
Drill hole information	• Within the database used, there are 1615 Exploration drill holes (467 DD, 32 RC with DD tail and 1116 RC) and 8842 grade control drill holes (all RC). • No individual drill hole is material to the Mineral Resource estimate and hence this geological database is not supplied.
Data aggregation methods	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section. • No metal equivalents were used in the Mineral Resource estimation.
Relationship between mineralisation width and intercepts lengths	• Mineralisation true widths are captured by interpreted mineralisation 3D wireframes. • Most drilling was at 50° to 60° angles in order to maximise true width intersections. • Geometry of mineralisation is interpreted as sub- vertical to vertical and as such current drilling allows true width of mineralisation to be determined.

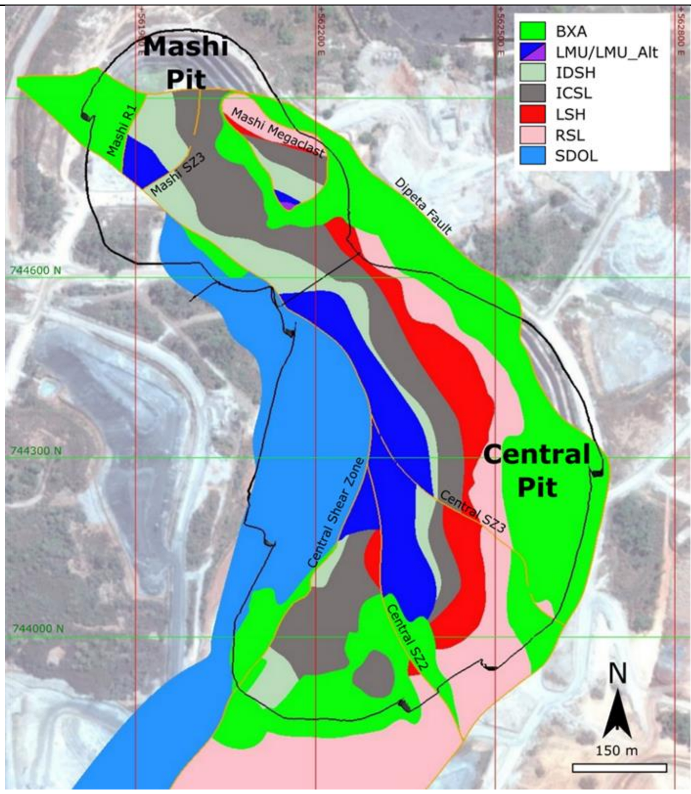
Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Diagrams	 **Plan view of the Kinsevere deposit**

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	 0.3% Cu Shell coded by Oxidation state (Green – Oxide / Red – TMO / Blue – Primary) **Typical cross section through Tshifufia (Central) pit showing mineralisation zones**
Balanced reporting	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section.
Other substantive exploration data	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section.
Further work	• The exploration focus will be within the Mine Lease and within a 50 km radius of the known deposit to explore for additional high-grade oxide material. • RC and DD drilling as part of near mine extension is ongoing.

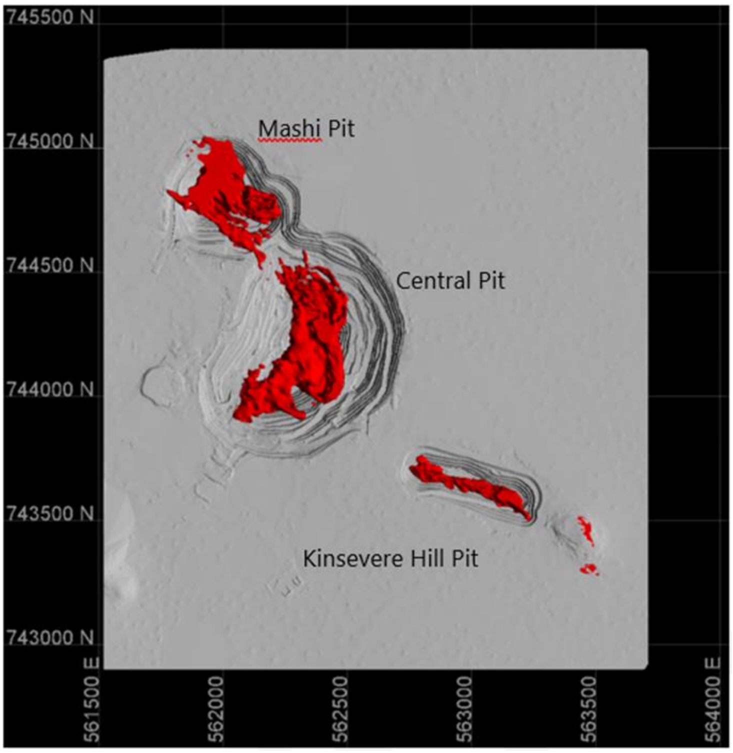
Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Database integrity	• The following measures are in place to ensure database integrity: ○ Drillhole data (RC and DD) is stored in two SQL databases with front end access provided by Geobank software. ○ The grade control logging and assay data (RC) is managed by the onsite Geology team with support from the Group Technical Services database team in Melbourne. ○ The exploration/resource logging data (RC and DD) is managed by the onsite Resource team with assay loading and support provided by the Group Technical Services database team in Melbourne. ○ Data is entered directly into Geobank or Geobank Mobile using the database validation rules. These check for data consistency, missing intervals, overlaps, invalid codes and invalid values, thus maintaining data integrity. ○ The databases offer secure storage and consistent data which is exposed to validation processes, standard logging and data recording lookup codes. • The measures described above ensure that transcription or data entry errors are minimised. ○ Data validation procedures include: ○ Internal database validation systems and checks. ○ Visual checks of exported drill holes in section and plan view, checking for accuracy of collar location against topography, and downhole trace de-surveying. ○ External checks in Vulcan software prior to the data used for Mineral Resources. Checks on statistics, such as negative and unrealistic assay values. • Any data errors were communicated to the Database team to be fixed in Geobank. Data used in the Mineral Resource has passed a number of validation checks both visual and software related prior to use in the Mineral Resource.
Site visits	• The Competent Person visited on two occasions during 2019 (February and July). Site visit work included: ○ Visits to the ROM stockpiles, open pit mine, core yard, sample preparation and on-site assay laboratory. ○ Discussions with geologists (mine and exploration), mine planning engineers and metallurgists.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**

Geological interpretation	• The geological interpretation is based on a combination of geological logging and assay data (total copper %). There is a relatively high level of confidence in both geological and grade continuity within the upper zone of the deposit that is drilled to grade control density. There is less certainty in the geological interpretation in the lower portions of the Mineral Resource purely due to a lower drilling density however due to recent infill drilling and geological interpretation/knowledge the interpretation is considered reliable.
	• Both grade control RC and exploration DD and RC holes were used in the interpretation of the geological domains that are used in the Mineral Resource.
	• No alternative interpretations of the Mineral Resource have been used. However, an Indicator Kriging approach was used to construct weathering domains (within the mineralised zone). Mg high grade domains (using a 5.5% Mg cut-off), Ca high grade (using a 9% Ca cut-off) and a Co zone (using a 0.08% Co cut-off) domains were constructed using Leapfrog software. Lithological domains were constructed using Leapfrog software.
	• Wireframe solids were created for the Cu mineralisation (using a 0.3% Cu cut-off) and was constructed using Leapfrog.
	• Geological logging and geochemical data analysis were used to determine the lithological domains.
	• The magnitude of the acid soluble copper/total copper (CuAs /Cu) ratio has been used as an important criterion for the determination of the oxide, TMO and primary sulphide zones. The following ratios have been used to delineate the respective zones:
	  ○ Oxide > 0.5
	  ○ Transition and mixed (TMO) between 0.3 and 0.5
	  ○ Primary < 0.3
	• The resulting weathering, lithology, mineralisation domains were combined to code the drill hole data and the block model used for estimation.
	• Structural features (faults / fractures) provide an important control on the mineralisation and grade continuity.

<table>
<tr><th colspan="2">Section 3 Estimating and Reporting of Mineral Resources</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td></td><td>


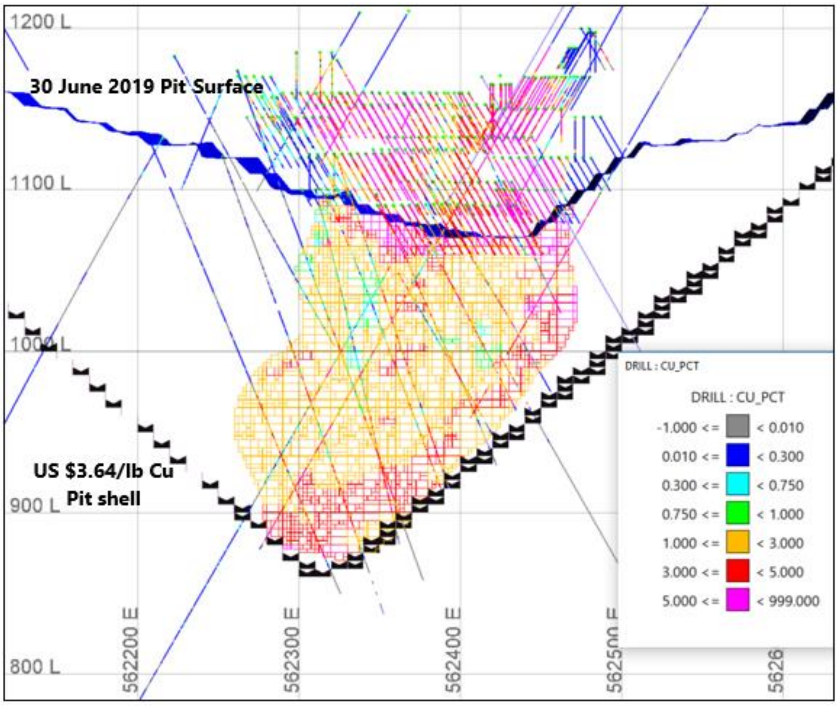
Plan View of Kinsevere Lithology Domains



Plan View of Kinsevere Cu>0.3% Mineralised Domains
</td></tr>
</table>

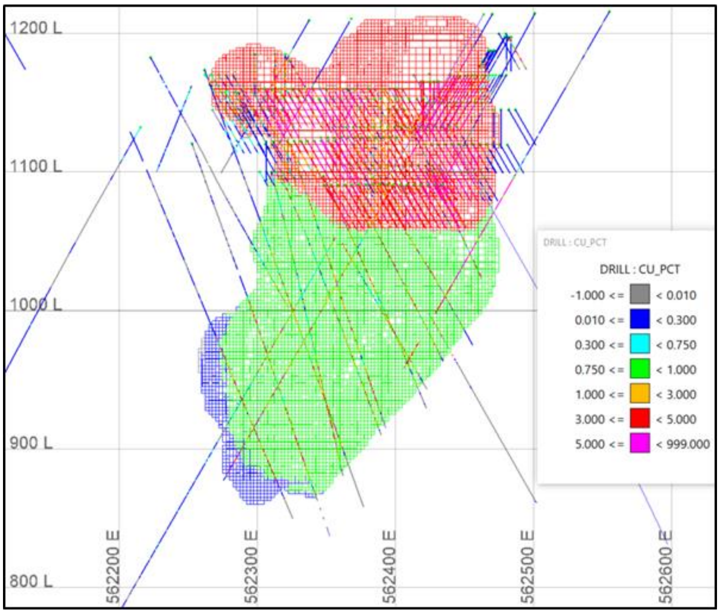
Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Dimensions	• The mineralisation strike length is approximately 1.3 km for the Tshifufia and Tshifufiamashi deposits while Kinsevere Hill has a 1km strike length. The mineralisation dips sub-vertically. Mineralisation extends to 400 m at depth and it can be up to 300m in width. • The mineralisation outcrops on Kinsevere Hill, and at the Tshifufiamashi deposit.
Estimation and modelling techniques	• Estimation applied mostly kriging interpolation within domains as outlined further in this section, and is considered appropriate for this style of mineralisation. • Mineral Resource modelling was conducted using Vulcan software. • Variograms updated for major elements including Cu, CuAs, Ratio, Ca and Mg. Variograms from 2018 were reviewed and changed based on new drilling. • The key estimation assumptions and parameters are as follows: o Cu, CuAs, CuAs/Cu (RATIO), Co, Ca, Fe, Mg, Mn and S were estimated using Ordinary Kriging (OK). Uranium (U) was estimated by using an Inverse Distance to the power of 2 method (ID2). o Indicator Kriging (IK) was used to determine oxide, mixed and primary sulphide domains, based on the CuAs/Cu ratio. Leapfrog software was used to construct high grade domains for Ca, Mg and Co. o Extreme grade values were managed by grade capping which was performed post compositing. Values greater than the selected cut value were set to the top cut (cap) value and used in the estimation. o Wireframes and surfaces of the topography; mineralised domains, together with IK domain are used to tag the drill holes and are used for statistical analysis and grade estimation. o Grade estimation was completed using a hard boundary for Cu, CuAS/Cu (Ratio), Co, Ca, Fe, S, Mg, Mn and S. o A composite length of 2m was used applied. Any residual intervals less than half the composite interval were appended to the previous sample interval. o No assumptions have been made about the correlation between variables. All variables are comparably informed and independently estimated. o Search parameters for Cu, CuAS, RATIO, Co, Ca, Fe, Mg estimate were derived from mineralisation and waste domain variography and on Quantitative Kriging Neighbourhood Analysis (QKNA). U search parameters based on a generic search of 400 m x 400 m x 400 m, U grades higher than 250 ppm were distance limited to 20m. o First estimation pass search radius uses 80% of the variogram range. Over 90% of the blocks are informed in the first pass. The second pass was set by reducing to the minimum sample estimated to the blocks. o Minimum of 2 to 4 and a maximum of 8 to 10 samples (depending on element and/or domain) for each estimate. o The search neighbourhood was also limited to a maximum of 3 samples per drill hole.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	○ Discretisation was set to 4 x 8 x 2 (X, Y, Z). ○ Kriging variance (KV), kriging efficiency (KE) and kriging regression slope (RS) of the Cu estimate were calculated during the estimation. • The 2018 and 2019 in-situ Mineral Resource models have been compared and show no material difference with metal content 3% lower for the 2018 model mainly due to drilling and subsequent re-interpretation in some areas. • The Comparison between the Mineral Resource and the mill feed grade is complicated by the operational strategy of treating high-grade ore and stockpiling lower-grade ore for later treatment. In late 2017 a stockpile adjustment occurred based on detailed survey pick-ups. Generally, there was a volume and metal reduction. • Kinsevere does not produce any by-products hence no assumptions regarding the recovery of by-products are made in the estimate or cut-off and reporting. • Parent block size of the Kinsevere block model is 10m x 20m x 5m with sub-blocking down to 2.5m. Estimation was into the parent block. The size of the blocks is appropriate to the spacing of drill holes. • No further assumptions have been made regarding modelling of selective mining units. • No further assumptions have been made regarding modelling of selective mining units. • The block model and estimate has been validated in the following ways: ○ Visual checks in section and plan view against the drill holes. ○ Grade trend plots comparing the model against the drill holes. ○ Global Change of support between the model to the sample support.
Moisture	• Tonnes in the model have been estimated on a dry basis.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Cut-off parameters	• The Oxide Mineral Resource has been reported above an acid soluble copper cut-off grade of 0.6% and an acid soluble to total copper ratio (Ratio) greater than or equal to 0.5. This is unchanged from the 2018 Mineral Resource. • For TMO Mineral Resource type, that defines transitional and mixed copper species, has been reported above a total copper cut-off grade of 0.7% and a Ratio greater than or equal to 0.3 and less than 0.5. The cut-off grade has dropped from 2018 (1.5%) due mainly to lower assumed processing costs and higher assumed recoveries based on a potential ferric leach operation considered as part of the Sulphide PFS study. • The sulphide Mineral Resource has been reported above a total copper cut-off grade of 0.8% and a Ratio less than 0.3. This cut-off has not changed from the 2018 Mineral Resource. • The reported Mineral Resources have also been constrained within a US$3.64/lb whittle pit shell. Both the sulphide and TMO cut offs have increased in 2019 due to strike price justification and all cut offs were assessed against a block by block Net Value calculation to confirm suitability. The reporting cut-off grade and the pit-shell price assumption are in line with MMG's policy on reporting of Mineral Resources which is prospective for future economic extraction.  **Cross-section of Copper Mineral Resource model contained within the US$3.64/lb pit shell**

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Mining factors or assumptions	• Mining of the Kinsevere deposits is undertaken by the open pit method, which is expected to continue throughout the life of mine. • Mining selection has been considered in the calculation of cut-off grade parameters and in the constraint of mineral resources within the US$3.64/lb Cu pit shell. • No mining factors have been applied to the Mineral Resource.
Metallurgical factors or assumptions	• The metallurgical process applied at the Kinsevere Operation applies acid leaching coupled with solvent extraction electro-winning (SXEW) technology to produce copper cathode plates for sale. • Resource cut-off grade reporting criteria is based on potential future economic extraction influenced by a ferric leach and flotation operation based on findings on a PFS study • Consideration of metallurgy and strike price have been included in the cut-off grade calculation, material type and in the construction of the US$3.64/lb pit shell. • No metallurgical factors have been applied to the Mineral Resource.
Environmental factors or assumptions	• Environmental factors are considered in the Kinsevere life of asset work, which is updated annually and includes provision for mine closure. • The property is not subject to any environmental liabilities. • PAF and NAF criteria is controlled by the acid neutralising capabilities of the dolomitic CMN unit and the potential acid forming potential of the shale rich SD which is known to contain pyrite where a sulphur cut off is utilised.
Bulk density	• In-situ dry bulk density values are determined from 6,676 diamond core density measurements, 4 in-pit bulk sample measurements and 12 in-pit measurements from specific lithologies. • Bulk sample and in-pit measurements account for void spaces. • Bulk density was calculated using the wet and dry method: • Bulk Density = Dry Sample Weight/(Dry Sample Weight – Wet Sample Weight) • Average in-situ bulk density values were assigned to the blocks within each domain. • There have only been minor immaterial changes from the values assigned for the 2018 Resource estimate within mineralised domains.
Classification	• Wireframes used for Mineral Resource classification are based on a combination of confidence in assayed grade, geological continuity and Kriging metrics (Kriging variance, efficiency and slope of regression, drilling spacing). • In general, Measured is defined drilling spacing less 20m x 20m, Indicated is 40m x 40m and Inferred ranges up to 80m x 80m.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• The Mineral Resource classification reflects the Competent Persons view on the confidence and uncertainty of the Kinsevere Mineral Resource.



Cross section showing Kinsevere Mineral Resource classification and drilling density (Red-Measured, Green-Indicated, Blue-Inferred)

Criteria	Commentary
Audits or reviews	• An external Mineral Resource audit was conducted by Maree Angus from AMC Consultants Pty Ltd in June 2019. Overall the review stated that the 2019 Mineral Resource has been compiled in accordance with the JORC 2012 guidelines and is fit for the purposes of conducting mining studies and estimating Ore Reserve. Recommendations were incorporated into the 2019 Mineral Resource. • MMG conducts annual internal reviews of Mineral Resource estimates. No significant issues have been identified.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Discussion of relative accuracy / confidence	• The estimation within structural domains is valid for estimating the grades, however by sub-domaining further on lithology and/or the use of local varying anisotropy (LVA) to accommodate changes in dip trough the deposit. • The 2018/2019 drilling information has improved the understanding of the copper mineralisation over Kinsevere deposit (especially in Kinsevere Hill South). This information has increased the knowledge of the geological controls on mineralisation which has been used to develop the current Mineral Resource estimate. • Estimates in the deeper primary copper mineralisation will not be as locally accurate, due to wider spaced drilling however the geological and grade interpretations are robust due to a high understanding of geological controls. The level of uncertainty is captured by the Indicated Inferred Mineral Resource category. • Close spaced grade control drilling is required to gain an understanding of the local grade distribution and local mineralisation controls. • Due to complexity of the weathering profile it was decided to use an Indicator Kriging approach based on the "ratio" of acid soluble copper to total copper. The weathering was defined into three cut-off ratio grades, oxide is defined at above 0.8, primary is defined below 0.2, and TMO is define between 0.2 – 0.8. A wide spread of "ratio" grades distribution in the TMO could potentially over smooth the estimate, more work is needed to control this effect. • The method of assigning bulk density values is similar to the 2018 Mineral Resource and is not considered to have any material impact on the reported tonnages. However, direct estimation of dry bulk density values needs to be evaluated where enough bulk density data is available.

4.1.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resource statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

4.1.3.1 *Competent Person Statement*

I, Douglas Corley, confirm that I am the Competent Person for the Kinsevere Mineral Resource section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australian Institute of Geoscientists and hold Registered Professional Geoscientist (RPGeo) accreditation.
- I have reviewed the relevant Kinsevere Mineral Resource section of this Report to which this Consent Statement applies.

I am a full time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Kinsevere Mineral Resource section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Kinsevere Mineral Resources.

4.1.3.2 *Competent Person Consent*

<u>Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)</u>

With respect to the sections of this report for which I am responsible – the Kinsevere Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____________________ Date: 22/10/2018

Douglas Corley MAIG R.P.Geo. (#1505)

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Rex Berthelsen
Melbourne

Signature of Witness: Witness Name and Residence: (e.g. town/suburb)

4.2 Ore Reserves - Kinsevere

4.2.1 Results

The 2019 Kinsevere Ore Reserves is based on the 2019 Mineral Resources model.

The 2019 Kinsevere Ore Reserves are summarised in Table 10.

Table 10 2019 Kinsevere Ore Reserves tonnage and grade (as at 30 June 2019)

Kinsevere Ore Reserves				Contained Metal	
Central Pit	**Tonnes (Mt)**	**Copper (% Cu)**	**Copper (% CuAS[1])**	**Copper ('000 t)**	**Copper AS[1] ('000 t)**
Proved	1.0	4.4	3.6	42	34
Probable	1.9	3.9	3.3	75	63
Central Pit Total	2.8	4.1	3.4	116	97
Mashi Pit					
Proved	0.1	2.2	1.8	1	1
Probable	0.1	2.8	2.6	4	4
Mashi Pit Total	0.2	2.6	2.4	5	5
Kinsevere Hill					
Proved	0.01	3.0	2.6	0.3	0.3
Probable	2.3	2.7	2.3	61	53
Kinsevere Hill Total	2.3	2.7	2.3	61	53
Stockpiles					
Probable	6.6	1.9	1.5	124	97
Stockpiles Total	6.6	1.9	1.5	124	97
Kinsevere Total	11.9	2.6	2.1	307	252

[1] AS= Acid Soluble

Cut-off grades were calculated at a US$3.18/lb copper price and are based on a Net Value Script considering gangue acid consumption. The cut-off grade approximates 1.3% CuAS for ex-pit material and 1.0% CuAS for existing stockpiles reclaim.

The average short-range price (2020 to 2023) is forecast to be $2.88/lb. At this short-range price ($2.88/lb), approximately 5.7Mt of the low-grade stockpiles included in this Reserve Estimate are potentially not economic.

Figures are rounded according to JORC Code guidelines and may show apparent addition errors.

Contained metal does not imply recoverable metal.

The main differences from the 2018 Ore Reserves are:

(i) Assumed copper price increased to US$3.18/lb in 2019 from US$3.02/lb in 2018.

(ii) Mine and stockpile depletion.

(iii) Mine to Mill Reconciliation study indicates that mining dilution is between 10 & 20% and ore loss between 9 & 21%:

- Introduction of a local dilution modelling technique.
- Dilution is estimated to be 17% for 2019 from 10% assumed in 2018.
- Ore Loss has increase to 11% in 2019 from 5% in 2018.

(iv) Insufficient material of economic grade to blend with low ratio (<0.5 CuAS / Cu) Black Shale material.

(v) Projected cash flows from Ore Reserves do not pay for the existing (30 June 2019) rehabilitation liability.

4.2.2 Ore Reserves JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 11 complies with the 2012 JORC Code requirements specified by "Table-1 Section 4" of the Code. Each of the items in this table has been summarised as the basis for the assessment of overall Ore Reserves risk in the table below, with each of the risks related to confidence and/or accuracy of the various inputs into the Ore Reserves qualitatively assessed.

Table 11 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Kinsevere Ore Reserves 2019

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Mineral Resource estimates for conversion to Ore Reserves	• The Mineral Resources are reported inclusive of the Ore Reserves. • The Ore Reserves includes Mineral Resources on stockpiles. • The sub-celled Mineral Resources block model named "kin_gmr_1906_v4_eng.dm" and dated 19-06-2019 was used for dilution and ore loss modelling. The pit optimisation and designs were generated from the diluted mining model "nsr_0619mso_c2cut_o2.dm". • Mineral Resources block model based on Ordinary Kriging interpolation has been applied for the estimation of all elements. It has a parent block size of 10m x 20m x 5m with sub blocking down to 2.5m. The mining model simulates a mining panel of 10m x 15m x 5m introducing localised dilution and ore loss. • "Non-processable" black shale stockpiles have been considered for economic inclusion in the Mineral Resources, drill information indicates they are processable.
Site visits	• The Competent Person visited the site in mid 2017 and August 2019. • Each visit consisted of discussions with relevant people associated with Ore Reserves modifying factors including geology, grade control, mine-to-mill reconciliation, mine dilution and mining recovery, geotechnical parameters, mine planning and mining operations, metallurgy, tailings and waste storage, and environmental and social disciplines. The outcomes from the visits have confirmed a common understanding of assumptions, calculation of the cut-off grades and development of the Life-of-Asset mine plan.
Study status	• The current mine and processing plant configuration has been in operation since September 2011. Ore Reserves are based on actual historical performance and cost data and projected based on the Life-of-Asset plan. • Life-of-Asset Reserve Estimate was produced as part of the MMG planning cycle. This Estimate informs the Ore Reserves – it demonstrates it is technically achievable and economically viable, while incorporating material Modifying Factors.

Cut-off parameters	• Breakeven cut-off grades (COG) were calculated at a US$3.18/lb copper price and acid soluble to total copper ratio typically greater than or equal to 0.5. At a variable gangue acid consumption based on the equation GAC (kg/t) = 33.823 x %Ca + 2.713 x %Mg + 2.8. The following approximate COG's are applied:
	  o 1.3% CuAS for ex-pit material.
	  o 1.0% CuAS for existing stockpiles reclaim.

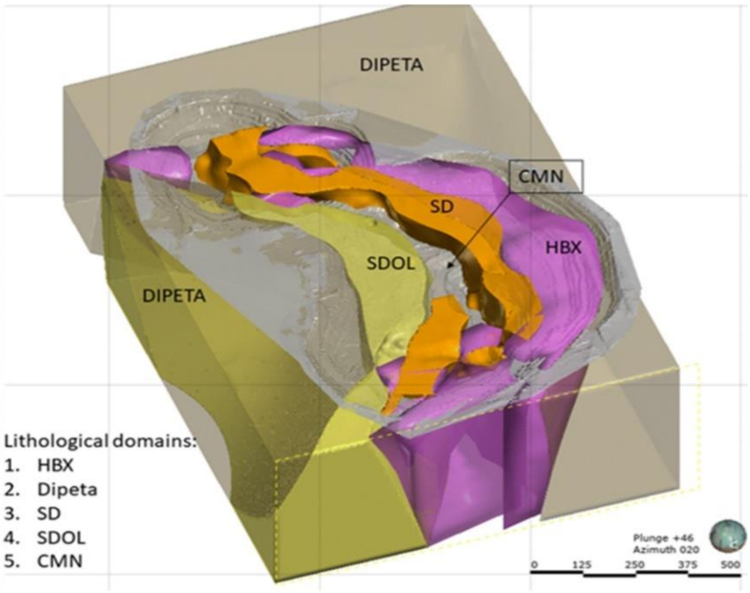
<table>
<tr><th colspan="2">Section 4 Estimation and Reporting of Ore Reserves</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td></td><td>

The ex-pit COG estimates are based on a Net Value Script (NVS) calculation that incorporates commodity price assumptions, gangue acid consumption and costs associated with current operating conditions.
The NVS routine identifies material that is both suitable and potentially economic for processing in the Mineral Resources Model. This material is then considered for inclusion in the Ore Reserves process.
For the cost assumptions please see the “Costs” section.
For the price assumptions please see the “Revenue factors” section.

</td></tr>
<tr><td>Mining factors or assumptions</td><td>

The method for Ore Reserves estimation included: mine dilution modelling, pit optimisation, final pit and phase designs, consideration of mine and mill schedule, all modifying factors and economic valuation.
Kinsevere mine is an open pit operation that is mining and processing oxide copper ore. The operation uses a contract mining fleet of excavators and both rigid body and articulated dump trucks along with a fleet of ancillary equipment.
This mining method is appropriate for the style and size of the mineralisation.
The pit optimisation was based on a mining model based on the 2019 Mineral Resources block model, and the strategy for the final pit selection was based on a revenue factor 1 (RF=1.0). The RF 1.0 pit shell is used across all assets in the MMG Group. Final pit designs incorporating further practical mining considerations were carried out using these optimisation shells.
Mining dilution is based on localised mining dilution modelling with an additional 7% unplanned dilution and 7% unplanned ore loss (was 10% and 5% respectively in 2018 Ore Reserves). The dilution and ore loss modelling were designed to reflect historic reconciliation data (2019 reconciliation study) of areas that are reflective of future mining.
Minimum mining width (bench size) is typically in excess of 45m but is ~35m in some isolated areas during stage development.
No Inferred Mineral Resources material has been included in optimisation and/or Ore Reserves reporting.
All required infrastructure is in place. Mining rates are planned to stay relatively constant and is within the capacity of the existing fleet and mining contractor capability.
The slope guidelines used for the 2019 Kinsevere Ore Reserves are as follows:

<table>
<tr><th>Domain</th><th>Weathering Code</th><th>BFA (Max °)</th><th>Bench Height</th><th>Berm width</th><th>IRA (°)</th><th>Stack height</th><th>Geotchnical Berm</th></tr>
<tr><td>All</td><td>W4</td><td>50</td><td>10</td><td>6</td><td>35</td><td rowspan="2">Geotech berm at base</td><td>10</td></tr>
<tr><td rowspan="2">HBX</td><td>W2/W3</td><td>60</td><td>10</td><td>8</td><td>40</td><td>20</td></tr>
<tr><td>W1</td><td>60</td><td>10</td><td>8</td><td>40</td><td>70</td><td>20</td></tr>
<tr><td rowspan="2">SDOL / Shales</td><td>W2/W3</td><td>60</td><td>10</td><td>6</td><td>45</td><td>50</td><td>20</td></tr>
<tr><td>W1</td><td>70</td><td>10</td><td>8</td><td>45</td><td>100</td><td>20</td></tr>
</table>
</td></tr>
</table>

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	○ These guidelines take into account new mapping information of exposures at Central East, as well as updated logging and domain interpretation in Central Pit. ○ 2018 guidelines remain unchanged for the Kinsevere Hill North and Kinsevere Hill South pits, which take into account observed performance of the current exposures. ○ Inter-ramp and overall slope design criteria have been increased from 2018 from Medium to High Consequence of Failure while further water and blast control measures are implemented i.e. inter ramp and overall slope factors of safety from limit equilibrium analysis are in excess of 1.2 to 1.3 and 1.3 to 1.5, respectively. This factor of safety has been increased from 1.2 and 1.3 in 2018, while further water and blast control measures are implemented. ○ The design sectors highlighted in the table above can be seen in the figure below:  ○ These guidelines take into account observed performance of the current exposures at Kinsevere and potential failure modes that could occur at bench, inter-ramp and overall slope scale at Kinsevere.
Metallurgical factors or assumptions	• Kinsevere is an operating mine. The metallurgical process is a hydrometallurgical process involving grinding, tank leaching, counter-current decantation (CCD) washing, solvent extraction and electrowinning. • The acid leach process has been operating successfully since start-up in September 2011. • Copper recovery is determined by the equation: *Cu recovery (%) = (0.96*CuAS)/TCu*

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	where CuAS refers to the acid soluble copper content of the ore which is determined according to a standard test. The CuAS value has historically been around 80 to 90% of the total copper value though the exact percentage varies with the ore type. Much of the non-acid soluble copper is present in sulphides which are not effectively leached in the tank leaching stage. • The reconciliation between expected and actual recovery is checked each month. The following table summarizes the outcomes for the last four quarterly periods.

Period	Recovery of Acid Soluble Copper (%)	
	Predicted	Actual
Q3 2018	96.0	97.2
Q4 2018	96.0	97.3
Q1 2019	96.0	96.4
Q2 2019	96.0	95.7

- The main deleterious components of the ore are carbonaceous (black) shales which increase solution losses in the washing circuit and dolomite which increases acid consumption in the leaching process.
- The effect of black shale is currently controlled by blending which is used to limit the percentage of this component in the feed to less than 35%.
- Total gangue acid consumption has been estimated based on the following equation GAC (kg/t) = 33.823 x %Ca + 2.713 x %Mg + 2.8.
- To prevent process issues, ore feed to the mill is blended to ensure the gangue acid consumption does not exceed 35kg/t.
- For Ore Reserves, a processing capacity of approximately 2.5Mtpa of ore and an electrowinning capacity of 80ktpa of copper cathode has been assumed. Both mill throughput and cathode production rates have been demonstrated as sustainable.
- Kinsevere mine does not produce any by-products.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Environmental	• Geochemical analysis of mine waste material over a two year period (2017 onwards) has been reviewed to confirm the classification of Potential Acid Forming (PAF) material. The review resulted in a change to the PAF classification. The updated classification has reduced the volume of potentially acid generating material (separating non-acid generating materials from potentially acid generating materials), thus preserving clean waste for construction and rehabilitation requirements. • Surface water management plans for the short and medium term have been completed and are progressively being implemented. Construction and maintenance of infrastructure will be continuing throughout the 2019 dry season. • Existing tailings storage facility (TSF 2) has design capacity to meet the 2019 Ore Reserves requirements.

Infrastructure	• The Kinsevere mine site is well established with the following infrastructure in place:
	  ○ The plant is operational.
	  ○ Labour is mostly sourced from Lubumbashi and surrounding villages with some expatriate support. There is an existing accommodation facility onsite.
	  ○ There is sufficient water for the processing.
	  ○ Copper cathode is transported off-site by truck.
	  ○ Site has an access road that is partially sealed.
	  ○ There is power supply from the national grid and from onsite generators.
	  ○ The Ore Reserves do not require any additional land for expansion.
	  ○ Tailings Storage Facility in place and future lifts are planned for.
	• Grid power in country can be intermittent; mitigation management is through diesel-based power generation. Future grid power availability is forecast to improve.
	• Timely dewatering of the mining areas continues to be an important aspect of mining operations.

Costs	• Kinsevere is an operating mine, historical costs have been used to inform the 2019 Kinsevere Budget (January 2019 to December 2019), with the exception of the contract mining costs. • Mining costs are based on the 2019 contract mining costs. • Transportation charges used in the valuation are based on the actual invoice costs that MMG are charged by the commodity trading company per the agreement. • Royalties charges have been considered, approximating 6% of the revenue. • The processing costs include calculated gangue acid consumption.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The final product contains no deleterious elements. • US dollars have been used thus no exchange rates have been applied. • Weathering profiles have been used to model in-pit blasting costs. • Since the final product is copper cathode (Grade A non LME registered) there are no additional treatment, refining or similar charges. • Sustaining capital costs have been included in the pit optimisation. The sustaining capital costs are principally related to the tailings storage facility lift construction and the process plant. The inclusion or exclusion of these costs in the Ore Reserves estimation is based on accepted industry practice. • A cash flow model was produced based on the mine and processing schedule and the aforementioned costs. • The Ore Reserves estimation has been based on the abovementioned costs.
Revenue factors	• For cost assumptions see section above – "Costs" • The assumed long-term copper price is US$3.18/lb which is used to inform the cut-off parameters (see cut-off section above). These prices are provided by MMG corporate, approved by the MMG Board, and are based on external company broker consensus and internal MMG analysis. • The average short-range price (2020 to 2023) is forecast to be $2.88/lb. Of note, at this short-range price ($2.88/lb), approximately 5.7Mt of the low-grade stockpiles included in this Reserve Estimate are potentially not economic. • At the stated Reserve price ($3.18/lb), there is an additional 2.0Mt of low ratio (<0.5 CuAS/TCu), Black Shale material that could potentially be economically processed. The current practise is to process Black Shale material at a maximum blend of 35% of the total feed. At this stage, there is insufficient non-Black Shale material that is of economic grade for blending purposes. Further, studies are proposed to identify opportunities to process Black Shale material at greater proportions.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Market assessment	• MMG considers that the outlook for the copper price over the medium and longer term is positive, supported by further steady demand growth. • Global copper consumption growth will continue to be underpinned by rising consumption in China and the developing countries in Asia as these nations invest in infrastructure such as power grids, commercial and residential property, motor vehicles and transportation networks and consumer appliances such as air conditioners. • Global copper demand will also rise as efforts are made to reduce greenhouse gas emissions through increased adoption of renewable energy sources for electricity generation and electric vehicles for transportation. • Supply growth is expected to be constrained by a lack of new mine projects ready for development and the requirement for significant investment to maintain existing production levels at some operations. • There is a life of mine off-take agreement with a trading company in place for all Kinsevere's copper cathode production. The off-take arrangement has been in place since the commencement of cathode production at site and has operated effectively. There is no reason to expect any change to this in future.
Economic	• The costs are based on historical actuals, the 2019 Kinsevere Budget and current contractor mining costs. • Revenues are based on historical and contracted realised costs. Copper price is based on MMG's short term pricing forecast (2020 to 2023) with a long-term forecast of $3.18/lb. • The Ore Reserves financial model demonstrates the mine has a positive NPV, assuming existing rehabilitation liability costs are treated as sunk. A significant proportion of the Ore Reserve low grade stockpiles (5.7Mt) are potentially uneconomic at the average forecast short-range copper price ($2.88/lb). • The discount rate is in line with MMG's corporate economic assumptions and is considered to be appropriate for the location, type and style of operation. • Standard sensitivity analyses were undertaken for the Ore Reserve work and support that the Ore Reserve estimate is robust, except for the low-grade stockpiles. As mentioned above, the low-grade stockpiles are potentially uneconomic at prices of less than $2.90/lb.
Social	• Social and Security teams are working together to mitigate security threats resulting from theft and other illegal activities by engaging the community to raise awareness of issues and garner support, improving security at the site. • There was an incursion and damage to the Social Development office during 2019. Officials continue to be engaged in the management of artisanal miners from the region and site. Improved security management has been implemented in response to incursions. • There was in increase in children entering site. The Social Development team, authorities and community chiefs continue to engage to address this issue and training programs were run through the schools to educate children on the dangers and risks they could be exposed to.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The Social Development team continue to engage with Community leaders and government representatives regarding the MMG Social Development Plan and governance and distribution of funds by the Cashier de' Charges to better direct the funds to those in need.
Other	• MMG has a Contrat d'Amodiation (Lease Agreement) with Gécamines to mine and process ore from the Kinsevere Project until 2024. A renewal application process for 15 year extension shall be submitted to DRC regulatory at least 1 year and no more than 5 years before the expiry date. • The PE 528 permit covers the three major deposits of Tshifufiamashi, Tshifufia and Kinsevere Hill/Kilongo. • A Contrat d'Amodiation is provided for under the DRC Mining Code, enacted by law No 007/2002 of July 11, 2002. • A conversion of the adjacent PR7274 to an exploitation permit was completed in 2018. Tenement amalgamation (of PE528 and PE7274) was completed in early March 2019, with PE7274 incorporated into PE528.
Classification	• The Ore Reserves classification is based on the JORC 2012 Code. The basis for the classification was the Mineral Resources classification and cut-off grade. The ex-pit material classified as Measured and Indicated Mineral Resources and is above 1.3% CuAS with an acid soluble to total copper ratio greater than or equal to 0.5, and is demonstrated to be economic to process, is classified as Proved and Probable Ore Reserves respectively. • Existing stockpile material at Kinsevere is classified as Indicated. Indicated Mineral Resources above 1.0% CuAS with an acid soluble to total copper ratio greater than or equal to 0.5, and is demonstrated to be economic to process, is classified as Probable Ore Reserves. • The Ore Reserves do not include any Inferred Mineral Resources.
Audit or Reviews	• An external Ore Reserves audit was completed in 2018 on the 2017 Ore Reserves. The work was carried out by AMC Consultants. Whilst some minor improvements were suggested, no material issues were identified. • The next external Ore Reserves audit is planned for completion in 2021 on the 2020 Ore Reserves.

Discussion of relative accuracy/ confidence	• The most significant factors affecting confidence in the Ore Reserves are:
	  o Mining Dilution and Ore Loss.
	  o Existence of Karst features, with respect to perched water and impacts to mining Dilution and Ore Loss.
	  o Increase in operating costs for mining and processing.
	  o Geotechnical risk related to slope stability.
	  o Effective management of both ground and surface water.

4.2.3 Expert Input Table

A number of persons have contributed key inputs to the Ore Reserves determination. These are listed below in Table 12.

In compiling the Ore Reserves the Competent Person has reviewed the supplied information for reasonableness, but has relied on this advice and information to be correct.

Table 12 Contributing experts – Kinsevere Mine Ore Reserves

EXPERT PERSON / COMPANY	AREA OF EXPERTISE
Doug Corley, Geology Manager AAA, MMG Ltd (Melbourne)	Mineral Resources model Stockpile Tonnes and Grade
Nigel Thiel, Metallurgy Manager AAA, MMG Ltd (Melbourne)	Metallurgy
Jeff Price, Principal Geotechnical Engineering, MMG Ltd (Melbourne)	Geotechnical parameters
Dean Basile, Principal Mining Engineer, Mining One Consultants (Melbourne)	Mining costs, pit designs, mine and mill schedules, Ore Reserves estimate
Kinsevere Geology department	Production reconciliation
David Machin, Principal Water and Tailings Engineer, MMG Ltd (Melbourne)	Tailings Capacity
Knight Piésold	Tailings dam design
Nerissa Beerbul, Senior Analyst, Business Evaluation, MMG Ltd (South Africa)	Economic Assumptions and evaluation
Melanie Stutsel, General Manager Safety, Environment and Social Performance, MMG Ltd (Melbourne)	Environment
Narelle Woolfe, Group Manager Social Performance, MMG Ltd (Melbourne)	Social
Steve Whitehead, General Manager Marketing, MMG Ltd (Melbourne)	Marketing

4.2.4 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Ore Reserve statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

4.2.4.1 Competent Person Statement

I, Dean Basile, confirm that I am the Competent Person for the Kinsevere Ore Reserves section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australasian Institute of Mining and Metallurgy
- I have reviewed the relevant Kinsevere Ore Reserves section of this Report to which this Consent Statement applies.

I am a full time employee of Mining One Pty Ltd.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Kinsevere Ore Reserves section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Kinsevere Ore Reserves.

4.2.4.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Kinsevere Ore Reserves - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	22/10/2019
Dean Basile MAusIMM(CP) (#301633)	Date:
This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	Douglas Corley Melbourne, VIC
Signature of Witness:	Witness Name and Residence: (e.g. town/suburb)

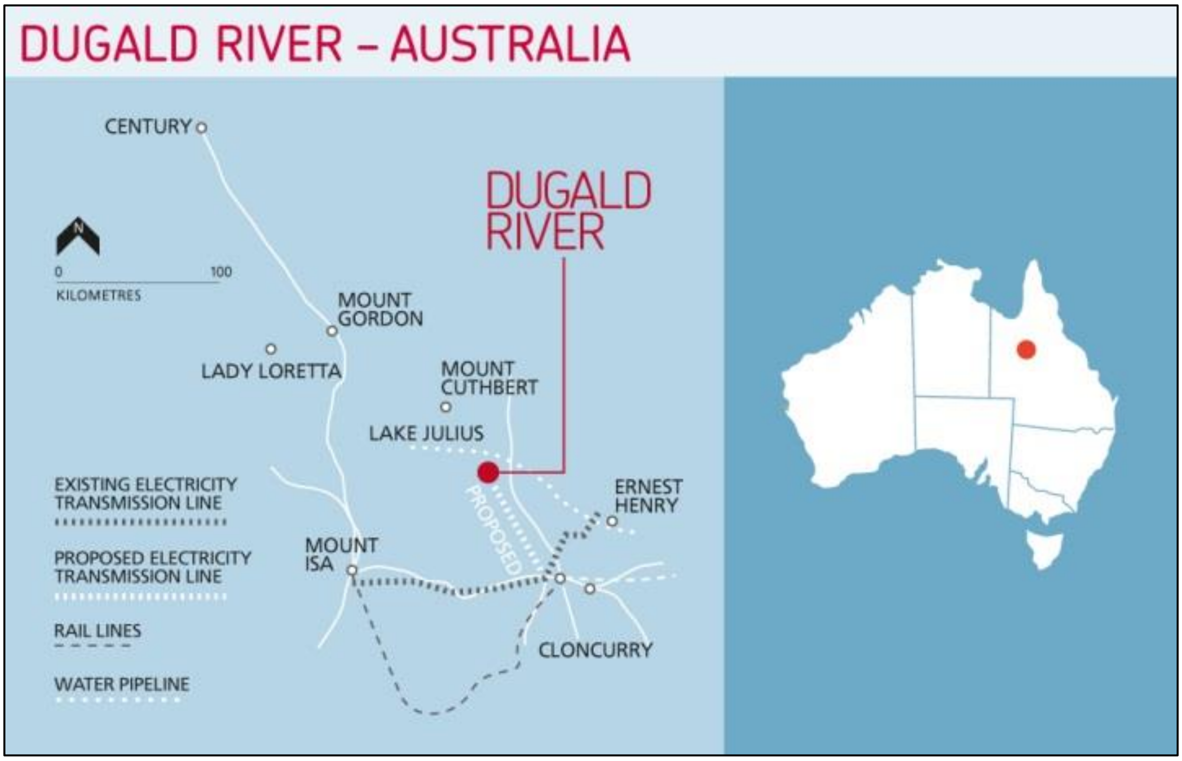
5 DUGALD RIVER PROJECT

5.1 Introduction and Setting

The Dugald River project is located in northwest Queensland approximately 65km northwest of Cloncurry and approximately 85km northeast of Mount Isa (Figure 5-1). It is approximately 11km (by the existing access road) from the Burke Developmental Road, which runs from Cloncurry to Normanton.

It is an underground zinc-lead-silver deposit containing 59Mt at 12.2% zinc, 1.6% lead and 26 g/t Ag (as of 30 June 2019 at a $138/t NSR cut-off) and is wholly owned by a subsidiary of MMG Limited.

Figure 5-1 Dugald River project location



5.2 Mineral Resources – Dugald River

5.2.1 Results

The 2019 Dugald River Mineral Resources are summarised in Table 13. The Mineral Resource has been depleted to account for mining of ore by way of underground development of ore drives and stope production. The 2019 Mineral Resource has been reported above an A$138/t NSR *(net smelter return)* cut-off.

Table 13 2019 Dugald River Mineral Resource tonnage and grade (as at 30 June 2019)

Dugald River Mineral Resource							Contained Metal				
	Tonnes (Mt)	Copper (% Cu)	Zinc (% Zn)	Lead (% Pb)	Silver (g/t Ag)	Gold (g/t Au)	Copper ('000)	Zinc ('000)	Lead ('000)	Silver (Moz)	Gold (MoZ)
Primary Zinc[1]											
Measured	12.9		13.1	2.3	69			1,685	301	29	
Indicated	21		12.3	1.6	23			2,566	334	15	
Inferred	26		11.7	1.2	7			2,979	316	6	
Total	**59**		**12.2**	**1.6**	**26**			**7,230**	**951**	**49**	
Stockpiles											
Measured	0.1		10.8	1.8	53			9	1.5	0.1	
Total	**0.1**		**10.8**	**1.8**	**53**			**9**	**1.5**	**0.1**	
Total Primary Zinc	**59.3**		**12.2**	**1.6**	**26**			**7,238**	**953**	**49**	
Primary Copper[2]											
Inferred	8.7	1.6				0.2	136				0.06
Total	**8.7**	**1.6**				**0.2**	**136**				**0.06**
Dugald River Total							**136**	**7,238**	**953**	**49**	**0.06**

[1] $138/t NSR Cut-off, in-situ (less depletion and oxide material)

[2] 1% Cu Cut-off, in-situ (less depletion and oxide material)

Figures are rounded according to JORC Code guidelines and may show apparent addition errors.

Contained metal does not imply recoverable metal

5.2.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 14 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 14 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Dugald River Mineral Resource 2019

<table>
<tr><th colspan="2">Section 1 Sampling Techniques and Data</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td>Sampling techniques</td><td>

- Diamond drilling (DD) was used to obtain an average 1m sample length while still respecting geological contacts. DD core was sampled either whole, ¾, ½, ¼. Once samples are selected by a geologist the samples are marked and the allocated sample ID's stored in the database.
- Table below shows samples collected at Dugald River for use in the Mineral Resource model by drill type, hole size and sample type.

Drill Type	Hole Size	Sample Type	Metres	% of Total
DD	PQ	Whole Core	254.8	0.23%
		UNK	230.16	0.21%
	PQ3	1/2 Core	11	0.01%
		1/4 Core	7	0.01%
	HQ	Whole Core	2132.73	1.96%
		1/2 Core	1013.97	0.93%
		1/4 Core	295.63	0.27%
		3/4 Core	409.28	0.38%
		UNK	370.5	0.34%
	HQ2	1/2 Core	5	0.00%
	HQ3	1/2 Core	5802.45	5.34%
	NQ	Whole Core	3099	2.85%
		1/2 Core	206.2	0.19%
		1/4 Core	42	0.04%
		UNK	315.8	0.29%
	NQ2	Whole Core	38215.21	35.18%
		1/2 Core	34050.2	31.35%
		1/4 Core	51.19	0.05%
		UNK	188	0.17%
	NQ3	Whole Core	6	0.01%
		1/2 Core	1211.57	1.12%
		UNK	157.8	0.15%
	BQ/BQTK	Whole Core	253.36	0.23%
		1/2 Core	113.65	0.10%
	LTK60	Whole Core	3783.19	3.48%
		1/2 Core	2902.67	2.67%
	UNK	Whole Core	1749.6	1.61%
		1/2 Core	457.5	0.42%
Total DD			**97,335.46**	**89.61%**
RC	100mm & 150mm	Chips	1720	1.58%
	5.75in	Chips	1761.6	1.62%
	UNK	Chips	7802.3	7.18%
Total RC			**11,238.90**	**10.39%**
Grand Total			108,619.36	100%

- Approximately 10% of the dataset was sampled using RC drilling techniques; however this is confined to pre-collar surface drilling and generally from regions outside of the mineralised zone. Approximately 24% of the total drilled meters were sampled.
- Since 2010, samples are bagged, numbered and dispatched to ALS Mt Isa laboratory:
  - Until 2016 ,the sample was jaw crushed, 50% split,

</td></tr>
</table>

Section 1 Sampling Techniques and Data

Criteria	Commentary

- Crushed using a Boyd crusher 70% nominal passing 2mm. Since 2018 all core samples are jaw crushed then 100% re-crushed using a Boyd crusher, 70% nominal passing 3.15mm
- The sample is rotary split with 500-800g retained and pulverised to 85% passing 75µm.
- All rejected material is collected and saved (Coarse – jaw crushed product, collected 2010 to 2016).
- Pulps are then sent to ALS Brisbane for analysis.

* For the 2007/2008 programme laboratory sample preparations involved drying, crushing (jaw and Boyd), and pulverising the ½ core sample to 85% passing 75µm.
* No detailed information can be found for laboratory preparation prior to 2007, however a similar procedure is assumed.
* Varieties of laboratories have been used over time and have been summarised in the table below (over 89% of all assays have been through the ALS laboratories).

Date Range	Laboratory	Number of samples	% of Total
2010 - 2019	ALS	80626	76.64%
	GENALYS	439	0.42%
2001 - 2009	ALS	13142	12.49%
	UNK	96	0.09%
Prior to 2000	AAL	234	0.22%
	AMDEL	4608	4.38%
	Aminya	262	0.25%
	ANALABS	2035	1.93%
	PILBARA	2183	2.08%
	UNE	7	0.01%
	UNK	1568	1.49%
Grand Total		105,200	100%

* Since 2010 the four acid the digestion process used (ALS Brisbane) is as follows:
  - Approximately 0.25g of sample catch weighed into a Teflon test tube.
  - HNO_3 and $HClO_4$ are added and digested at 115°C for 15 minutes.
  - HF is added and digested at 115°C for 5 minutes.
  - The tubes are then digested at 185°C for 145 to 180 minutes. This takes the digest to incipient dryness (digest is not "baked")
  - 50% HCl is added and warmed
  - Made to 12.5ml using 9.5ml 11% HCl.

* The table below summaries the analytical method and digest used for all assays in the Mineral Resource estimate. As can be seen, the majority of assays have been determined by using a four acid digest with an ICP OES read.

Base Metal Analysis	Analytical Method								Total
	AAS	ICP	ICP AES	ICP AES OG	ICP MS	ICP AES MS	XRF	Unknown	
Four Acid	2579	227	72821	18180	46				93,853
Aqua Regia	5		7737	592		7			8,341
Mixed Acid			301		165				466
Perchloric	151		88						239
Unknown	231						7	1690	1,928
Total	2966	227	80947	18772	211	7	7	1690	104,827

* Gold assaying at Dugald River began in 1988 once the discovery of the hanging-wall copper lode was identified. Varieties of different assay methods have been

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	used, and are summarised in the table below. The majority of gold assays were done by ALS (Townsville), by Fire assay with an AAS read, with a 50g charge used since 2008. At total of 579 gold assays were completed using Aqua Regia with an AAS read (completed between 1990 and 1996).

Gold Analysis		Analytical Method					**Total**
		AR-AAS	FA-AAS 30g	FA-AAS 40g	FA-AAS 50g	Unknown	
Laboratory	AAL	96					96
	ALS		1364		13706		15070
	AMDEL	413	58	371	57	80	979
	ANALABS	70	684		158		912
	PILBARA				174		174
	UNK					64	64
Total		579	2106	371	14095	144	**17,295**
Percentage of Total (%)		3.35%	12.18%	2.15%	81.50%	0.83%	100.00%

- There are no inherent sampling problems recognised.
- Measures taken to ensure sample representivity include orientation of the drill holes as close as practical to perpendicular to the known mineralised structure, and the collection and analysis of field duplicates.

Drilling techniques

- Drilling used for the Mineral Resource started in 1969 and continued until present. Within the database used there are 2,699 drill holes (591 from surface {combination of RC and DD} and 2,108 DD underground), summarised in the table below.
- Approximately 6% of the surface drilling data does not have drillhole diameters recorded.

Hole Type	Hole Diameter	Meters	% of Total
DD	BQ	2,373.74	1%
DD	BQTK	698.87	0%
DD	HQ	26,772.03	6%
DD	HQ2	5.00	0%
DD	HQ3	22,142.36	5%
DD	LTK60	5,961.59	1%
DD	NQ	47,763.08	10%
DD	NQ2	172,295.48	38%
DD	NQ3	3,091.80	1%
DD	PQ	617.70	0%
DD	PQ3	236.00	0%
DD	UNK	28,038.24	6%
DD_UG	LTK60	15,452.89	3%
DD_UG	NQ2	105,807.52	23%
DD_UG	NQ3	147.78	0%
RC	100	1,580.00	0%
RC	150	140.00	0%
RC	5.5in	2,196.00	0%
RC	5.75in	11,419.20	2%
RC	6in	266.40	0%
RC	UNK	2,053.00	0%
UNK	UNK	8,157.88	2%
Total		457,216.56	100%

DD = Surface diamond drilling, **DD_UG** = Underground diamond drilling, **PD**= Percussion drilling

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• Some Historical holes (drilled prior to 1969) and other listed drill holes were not used for this estimate due to poor sample quality and reliability.
Drill sample recovery	• Recovery recorded during core logging was generally 100%, with minor losses in broken / sheared and faulted ground. • At times, triple tube drilling from surface has been used to maximise core recovery but this is not common. • RQD (rock quality designation) data was logged and recorded in the database to measure the degree of jointing or fractures or core loss in the sample. • Shearing and broken ground zones are located at the edges of the mineralisation zone and are not associated with locations of good grade interceptions. There is no relationship between core loss and mineralisation or grade - no sample bias has occurred due to core loss within broken/sheared ground.
Logging	• All core samples including RC pre-collars have been geologically logged (lithology, stratigraphy, weathering, alteration, geotechnical characteristics) to a level that can support the Mineral Resource estimation. • The logging captures both qualitative (e.g. rock type, alteration) and quantitative (e.g. mineral percentages) characteristics. Core photographs are available for most drill holes. All drill holes post-2008 have been photographed (wet and dry). • A representative sample of mineralised core is stored at -4°C in refrigerated containers to minimise oxidation for metallurgical testing. Non-mineralised core is stored on pallets in the yard. • Currently, all drill holes are logged using laptop computers directly into the drillhole database. Logging has occurred in the past onto paper log-sheets and was then transcribed into the database.
Sub-sampling techniques and sample preparation	• Prior to 2007 various sub-sample techniques and sample preparation techniques were used for DD drilling including whole, ¾ (generally restricted to metallurgical samples) and ½ and ¼ (for general samples) core, where sample length is generally 1 metre. Since 2007 DD core was halved using a circular diamond saw, density tested before being sent to analytical testing. Sample lengths were cut as close to 1m as possible while respecting geological contacts. From 2016 whole core is sent for analysis for any in-fill drilling campaigns. • For DD, the standard sampling length is 1m with a minimum of 0.2m and a maximum 1.5m within the mineralised zone was determined by lithology and visible mineralisation (i.e., samples were taken up to but not across lithological contacts, and obvious high grade zones were sampled separately from lower grade intervals). • The sample collection protocol for RC grade control drill holes has typically been as follows; o RC samples are collected from a cyclone at 2m intervals from pre–collar surface drilling. o If the sample was dry the sample was passed through a riffle splitter and collected into a pre-numbered calico bag. Residual material was sampled and sieved for chip trays and the remainder returned to the larger poly-weave bag. The splitter was cleaned using compressed air or a clean brush and tapped

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	using a rubber mallet. If the sample was wet then the sample was dried before being split according to the procedure above (for dry samples). o Historical RC programmes were designed to test the 'un-mineralised' hanging wall material in DD pre-collars. 2m bulk composites stored at the drill site were sampled using the spear method. • The vast majority of drillhole intersections are orthogonal to the mineralisation and as such are representative. • The sample preparation of RC chips and DD core adheres to industry good practice. Samples are bagged, numbered and dispatched to the ALS Mount Isa laboratory. At the laboratory, each sample is weighed then crushed using a Boyd crusher to 70% nominal passing 3.15mm. The sample is rotary split (500-800g) and pulverised to in a LM2 to 85% passing 75 µm. All rejected material is collected and saved. Pulps are then sent to ALS Brisbane for analysis. • Prior to 2013, measures taken to ensure sampling is representative of the in-situ material collected included: o Field duplicates (quarter core) were sampled at a rate of 1 per 20 samples (approximately 4 per drill hole). • The sample types, nature, quality and sample preparation techniques are considered appropriate for the style of the Dugald River mineralisation (sediment/shear hosted base metal) by the Competent Person.
Quality of assay data and laboratory tests	• The assaying methods currently applied at Dugald River are ICP-MS with a 4-acid digest which is used for the analysis of Zn, Pb, Ag, Fe, S, Mn and Cu which are estimated in the Mineral Resource. Total carbon (TotC) is analysed by Leco furnace. All of these analyses are considered total. • Gold assays are completed by Fire Assay with an AAS read, with a 50g charge used since 2008. • These assaying techniques are considered suitable for the Dugald River Mineral Resource. • No geophysical tools, spectrometers or handheld XRF instruments have been used in the analysis of samples external to the ALS laboratory for the estimation of Mineral Resources. • Certified reference materials (CRM) and blanks (coarse) were each submitted at the rate of 1:20. The selection and location of standards and blanks in the batch sequence is decided by the geologist on the basis of the logged mineralisation. • Batches that fail quality control criteria (such as standards reporting outside set limits) are entirely re-analysed. • Prior to 2015 duplicate sampling was performed by selecting from returned coarse rejects and resubmitted to ALS for analysis. • Since 2015 duplicates are taken by the laboratory every 20th sample alternating between a duplicate taken at the primary crushing stage or the pulverisation stage.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	Batches that return standard values above three standard deviations (3SD) are failed and all or part of the batch is re-analysed by the Laboratory (ALS).
Verification of sampling and assaying	• Verification of assay results was visually verified against logging and core photos by alternative company personnel. • No twinning of drill holes have occurred at Dugald River. However, close-spaced and crossing holes give comparable grade and width results • Core logging data was recorded directly into a Database (Geobank) by experienced geologists (geological information such as lithology and mineralisation) and field technicians (geotechnical information such as recovery and RQD). Where data was deemed invalid or unverifiable it was excluded from the Mineral Resource estimation. • No adjustments to the assay data is performed during import into the Geobank Database.

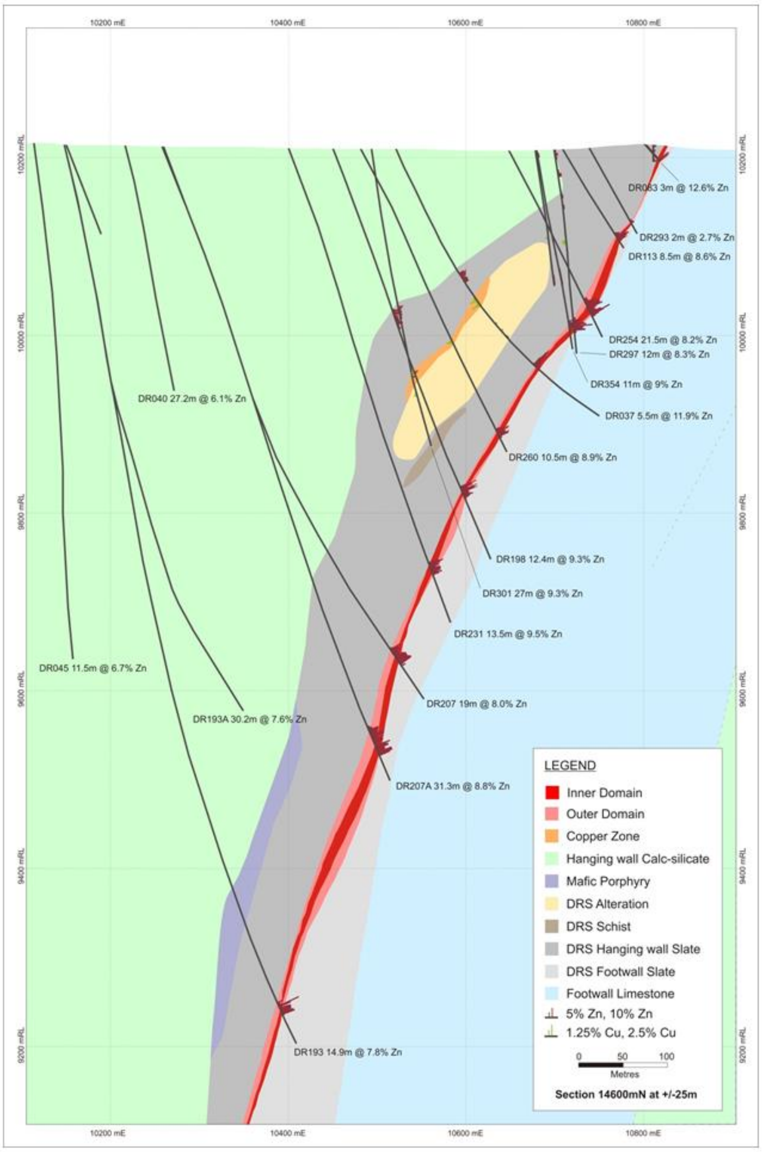
Location of data points	• All drill hole collars have been surveyed by licensed surveyors. Surface collars were surveyed in MGA94 and then converted to local mine grid.
	• Underground drill holes are marked up by surveying a collar pin at the designed collar point location which is supplied by the Geologists.
	  o Currently the drillers obtain their azimuth for the hole by utilising an azimuth aligner which is calibrated weekly using a test bed that is has a fixed azimuth.
	  o Upon completion of the drill program the collars of each drill hole are surveyed in local grid and saved into the drill hole register spreadsheet for the Geologists.
	  o The equipment used underground to perform drillhole surveys is a Leica TS-15 total station.
	• For surface holes a collar point is marked out with a survey peg and then two pegs at the extremities of the drill pad are surveyed for the azimuth of the hole.
	  o The drill rig lines up with these two pegs to drill on correct azimuth.
	  o The drillers also use a true north azimuth tool to check the bearing.
	  o The equipment used on surface for drill holes is a Trimble R8 RTK GPS.
	• Down-hole surveying has been undertaken using various methods including Eastman, Reflex and gyroscopic cameras. In general a spacing of 30m down hole between survey readings was used. Interference due to magnetite and pyrrhotite has been an issue.
	  o During the 2007/2008 drilling program routine survey checks were undertaken on the reflex survey camera using an aluminium calibration stand positioned in a known orientation.
	  o Since 2008 all drill holes are gyroscopically surveyed.
	  o True North seeking azimuth tool has been used since 2017, to limit the effect of magnetic declination corrections.
	• The grid system used is MGA94, the conversion to local mine grid is rotated and scaled. The grid transformation is undertaken using a formula provided by the onsite surveyors.

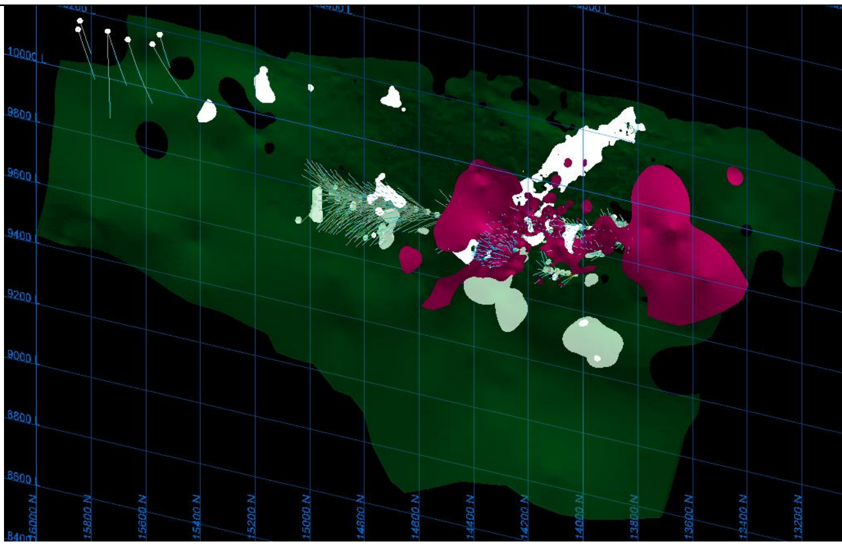
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• A LIDAR survey flown in 2010 is used for topographic control on surface drilled drill holes. In the view of the Competent Person the LIDAR survey provides adequate topographic control.
Data spacing and distribution	• Drill spacing varies across the strike and dip of the mineralisation lode. The highest drill density in the ore body is 20m x 10m while the lowest drill density is greater than 100m x 100m spacing. • Locations drilled at 20m x 10m and up to 20m x 20m are adequate to establish both geological and grade continuity. Wider spaced drilling is adequate for definition of broader geological continuity but not sufficient for accurate grade continuity. • Underground mapping of faces is digitised and used in the interpretation and wire-framing process. • Drillhole data is concentrated within the top 300 m of the Mineral Resource with broader-spaced drilling at depth, due to the difficulty and cost involved in drilling deeper sections. • Drill spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation procedure and classification applied. • Samples are not composited prior to being sent to the laboratory for analysis.
Orientation of data in relation to geological structure	• Geological mapping (both underground and surface) and interpretation show that the mineralisation is striking north-south and dips between 85 and 45 degrees towards the west. Hence drilling is conducted on east-west and west-east directions to intersect mineralisation across-strike. • Drilling orientation is not considered to have introduced sampling bias. Drill holes that have been drilled down dip and sub-parallel to the mineralisation have been excluded from the estimate.
Sample security	• Measures to provide sample security include: ○ Adequately trained and supervised sampling personnel. ○ Well maintained and ordered sampling sheds. ○ Cut core samples stored in numbered and tied calico sample bags. ○ Calico sample bags transported by courier to assay laboratory. ○ Assay laboratory checks of sample dispatch numbers against submission documents. ○ Assay data is returned as a .sif file via email and processed via the MMG assay loading software.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Audit and reviews	• The Dugald River database has been housed in various SQL databases. iOGlobal managed the database until the end of 2009 when the database was transferred and migrated to an MMG database. ○ Internal audits and checks were performed at this time. Any suspicious data was investigated and rectified or flagged and excluded. • No external independent audits have been performed on the database. • No external independent audits have been performed on the sampling techniques or the database. • Both ALS Mount Isa and Brisbane laboratories are audited on an annual basis by MMG personnel. From the most recent audit there were no material recommendations made.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Mineral tenement and land tenure status	• The Dugald River Mining Leases are wholly owned by a subsidiary of MMG Limited. • MMG holds one exploration lease and one mineral development lease in addition to the mining leases on which the Dugald River Mineral Resource is located. EPM12163 consists of 3 sub-blocks and covers an area of 20 sqkm to the west of the Dugald River deposit. ML2479 overlaps the eastern area of the EPM12163. • There are no known impediments to operating in the area.
Exploration done by other parties	• The History of the Dugald river zinc-lead deposit is summarised as follows: Discovered in 1881, the first drilling programme in 1936 comprised three drill holes. The maiden Mineral Resource was reported in 1953 by Zinc Corporation. Drilling continued from 1970 through 1983 totalling 28 drill holes. CRA then re-estimated the Mineral Resource in 1987. Between 1989 and 1992 a further 200 drill holes were drilled, resulting from the discovery of the high-grade, north plunging shoot. Infrastructure, metallurgical and environmental studies were undertaken during this period. Between 1993 and 1996 irregular drilling was focused on the delineation of copper mineralisation in the hanging wall. In 1997 the project was transferred to Pasminco, which had entered a joint venture with CRA in 1990. Recompilation of the database, further delineation drilling, metallurgical test work, and the check assaying of old pulps was completed. Continued drilling between 2000 and 2009 with subsequent metallurgical studies culminated in a Feasibility Study. Structural analysis and a focused review on the northern copper zone in 2010 were completed. In 2011 the decline commenced which resulted in trial stoping. In 2014 some underground development was completed and drilling focused on confirming and extending continuity of the mineralisation within the Dugald River lode.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Geology	• The Dugald River style of mineralisation is a sedimentary and shear hosted base metal deposit. The main sulphides are sphalerite, pyrite, pyrrhotite and galena with minor arsenopyrite, chalcopyrite, tetrahedrite, pyrargyrite, marcasite and alabandite. • The deposit is located within a 3 km-4 km along strike north-south trending high strain domain named the Mount Roseby Corridor and is hosted by steeply dipping mid Proterozoic sediments of the Mary Kathleen Zone in the Eastern Succession of the Mount Isa Inlier. The host sequence is composed of the Knapdale Quartzite and the Mount Roseby Schist Group (which includes the Hangingwall calc-silicate unit, the Dugald River Slate and the Lady Clayre Dolomite). The sequence is an interbedded package of greenschist to amphibolite grade metamorphosed carbonate and siliclastic lithologies. • The main Dugald lode is hosted within a major N-S striking steeply west dipping shear zone which cross cuts the strike of the Dugald River Slate stratigraphy at a low angle. All significant zinc-lead-silver mineralisation is restricted to the main lode. Lesser-mineralised hanging wall and footwall lenses are present. Three main mineralisation textures/types are recognised, including banded, slatey breccia, and massive breccia. • The mineralogy of the Dugald lode is typical of a shale-hosted base metal deposit. The gangue within the lode is composed of quartz, muscovite, carbonates, K-Feldspar, clays, graphite, carbonaceous matter and minor amounts of calcite, albite, chlorite, rutile, barite, garnet, and fluorite. • The mineralised zone extends approximately 2.4 km in strike length and up to 1.4 km down dip.
Drill hole information	• 2,699 drill holes and associated data are held in the database (combination of RC and DD). • No individual hole is material to the Mineral Resource estimate and hence this geological database is not supplied.
Data aggregation methods	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section. • No metal equivalents were used in the Mineral Resource estimation. However the Mineral Resource has been reported above an A$138 NSR calculated cut-off.
Relationship between mineralisation width and intercepts lengths	• Mineralisation true widths are captured by three-dimensionally modelled wireframes with drill hole intercept angles ranging from 90° to 40°. • The true thickness of the majority of the Mineral Resource is between 3m and 30m with the thickest zones occurring to the south.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Diagrams	 **Typical Cross section looking north – showing true width of the mineralisation**

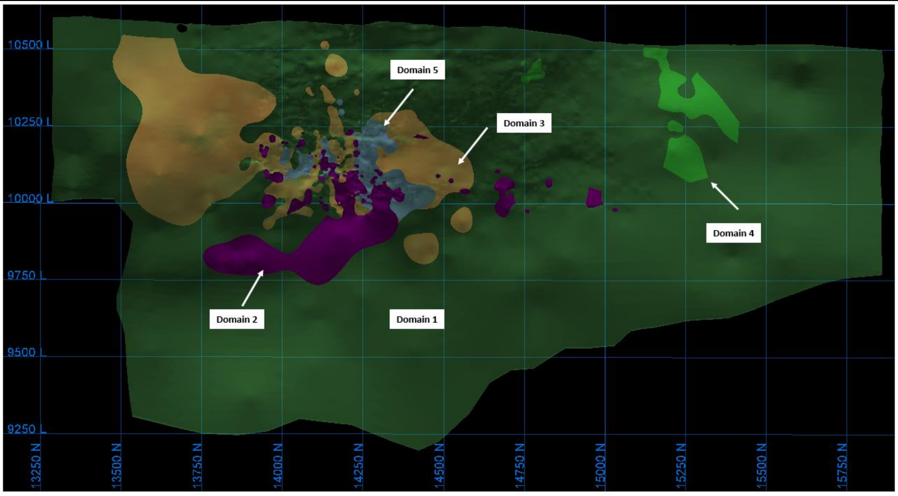
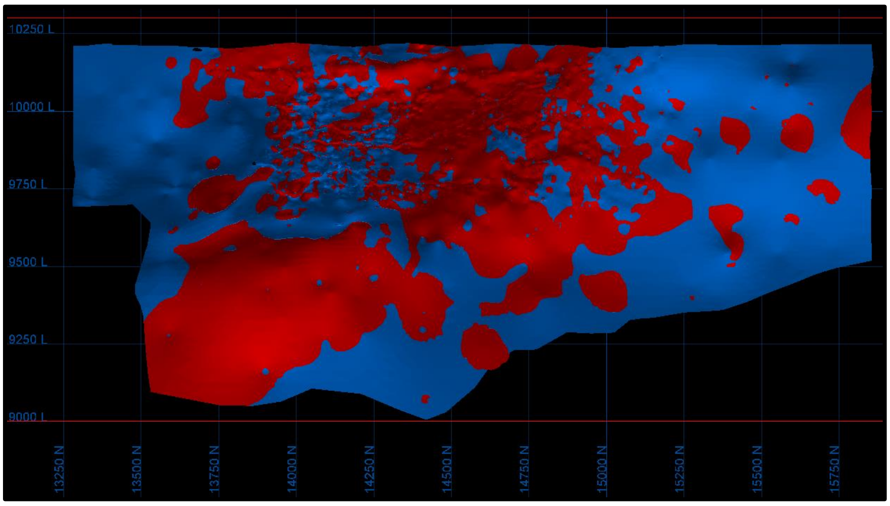
Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	 **Perspective View – looking NW of main mineralised zone with additional drillholes used for 2019 Resource Model (Main lode – Domain 1 in green)**
Balanced reporting	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section.
Other substantive exploration data	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section.
Further work	• MMG plans to continue to improve geological confidence and Mineral Resource classification through infill drilling programmes ahead of the mining schedule.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**

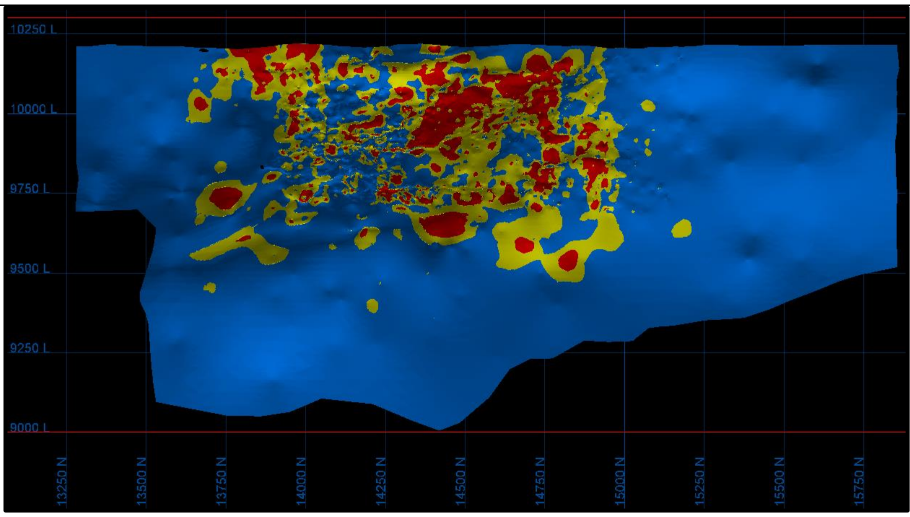
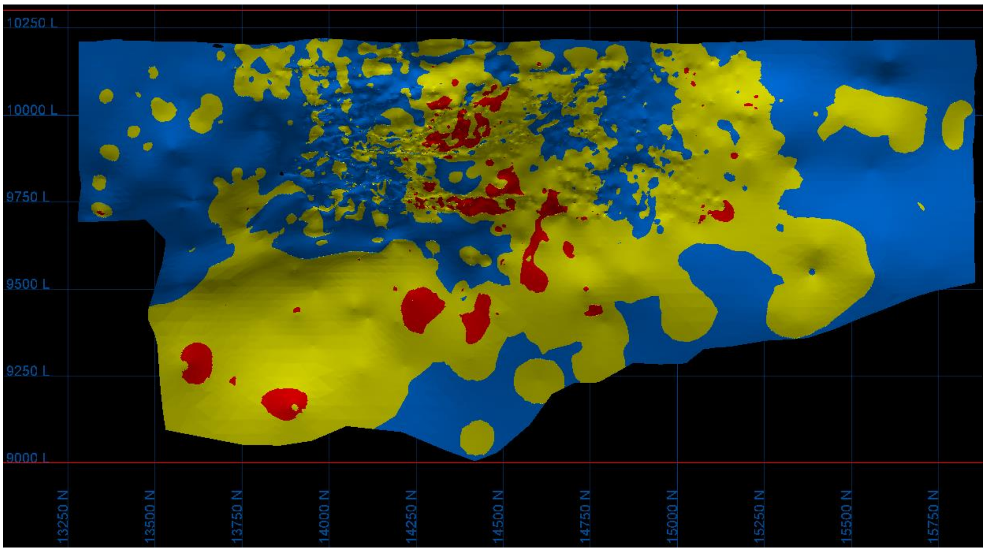
Database integrity	• The following measures are in place to ensure database integrity:
	  ○ All data is stored in an SQL database that is routinely backed up.
	  ○ All logging is digital and directly entered into the onsite Geobank database. Data integrity is managed by internal Geobank validation checks/routines that are administered by the Database Group and/or the site Geology Team.
	• The measures described above ensure that transcription or data entry errors are minimised.
	  ○ Data validation procedures include: Database validation procedures are built in the database system to manage accurate data entry during logging and collection of data.
	  ○ Prior to use in the Mineral Resource the data was checked externally by running Datamine macros on the drill hole file to check for end of hole depths, and sample overlaps.
	  ○ Manual checks were carried out by reviewing the drill hole data in plan and section views.

Site visits	• The Competent Person visited site on various occasions through 2018 and 2019. Site visits included involvement with:
	  ○ Assist with wireframe interpretation and methodology as applied in the 2019 Mineral Resource work.
	  ○ Inspection of geological mapping plans.
	  ○ Inspection of underground workings.
	  ○ Inspection of drill holes and mineralisation interceptions.

Geological interpretation	• The mineralisation zone is modelled within a continuous corridor of zinc mineralisation. This zone is modelled based on zinc grade distribution and geological logging of mineralisation style. The mineralised envelope is determined by natural breaks in the grade distribution. There is good confidence on the geological continuity and interpretation of the deposit.
	  ○ The mineralisation zone is further sub-divided into a high- and low-grade zinc domain.
	  ○ The “inner” high-grade domain is the main Dugald River mineralisation lode, defined by high zinc grades associated with the massive sulphide assemblages. The high-grade domain boundary was selected by a grade boundary which is more representative of geology.
	  ○ The “outer” zone defines the surrounding lower grade mineralisation with its associated assemblage of sulphide stringers and shoots of discontinuous massive and breccia sulphide textures.
	  ○ Where possible a low grade (internal dilution) domain has been identified and modelled within the high grade domain.
	  ○ There are 4 other smaller, sub-parallel zinc domains which have been identified with more closely spaced drilling, which generally follow the main mineralised lode (Domain 1) or structures associated with it.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	 **Looking West Long Section - Five LGZN Domains (HGZN domains are within LGZN domains)** • Separate domains were modelled for Pb, Ag and Mn mineralisation, after exploratory data analysis (EDA), have shown these elements are possibly due to a secondary mineralisation event; and are contained within the "outer" lower grade zinc domain.  **Looking West Long Section Pb Domains – D1 (Blue – Low Grade / Red –High Grade)**

Section 3 Estimating and Reporting of Mineral Resources

Criteria	Commentary
	 **Looking West Long Section Ag Domains – D1 (Blue – Low Grade/ Yellow – Medium Grade / Red – High Grade)**  **Looking West Long Section Mn Domains – D1 (Blue – Low Grade/ Yellow – Medium Grade / Red – High Grade)** • Selection of the low/high grade zinc domain was based on geological observations and natural breaks within the mineralisation. An approx. zinc grade of 2 to 7% Zn was used to define the "outer" low grade zinc domains and a grade of greater than 7% Zn was used to define the "inner" high grade zinc domain. • There is also a hanging-wall copper domain (relative to the zinc domains). The copper domain also has elevated gold which is associated with the copper. There are three types of mineralisation identified; a narrower vein style and a broader disseminated zone within a 0.1% Cu shell and an internal higher grade zone within a 0.3% Cu shell. The hanging wall copper domain generally runs parallel to the main zinc domain, though there some areas where there is some cross-over between the zinc and copper domains.

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<tr><th colspan="2">Section 3 Estimating and Reporting of Mineral Resources</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
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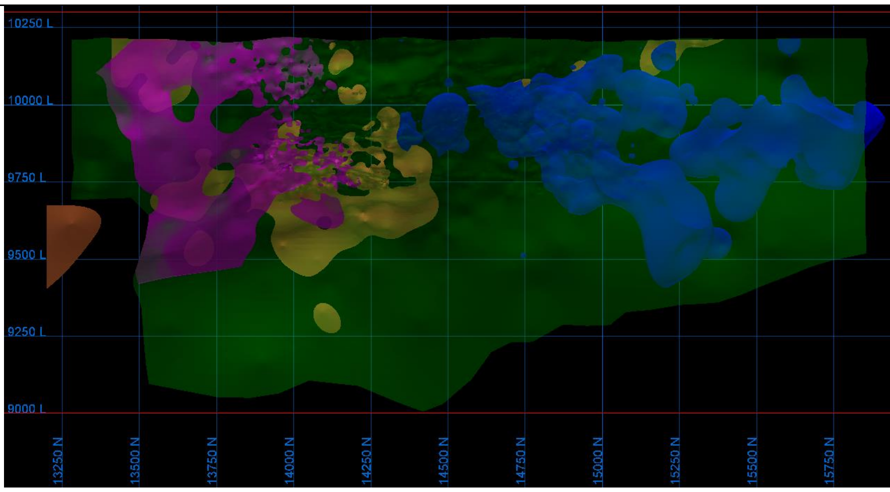
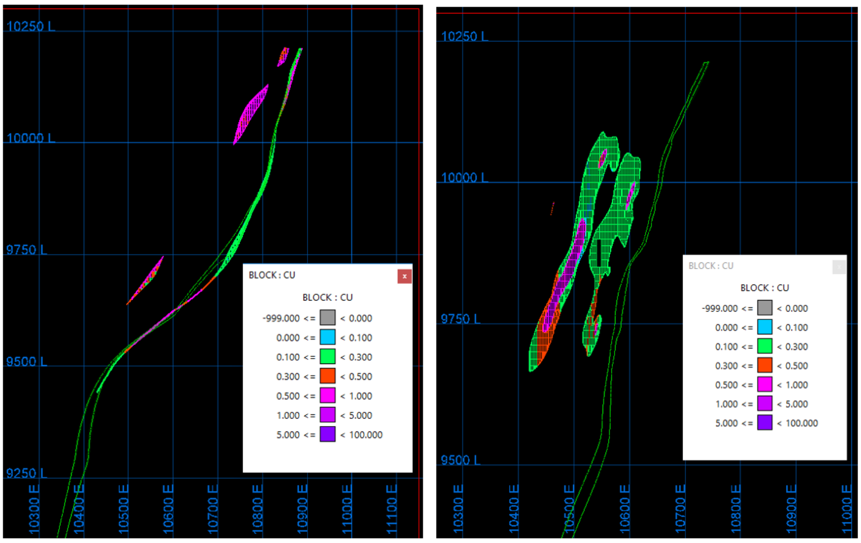


Looking West Long Section of hanging wall Copper Domain (1500 – Vein {orange}, 1510 – 0.1% Cu shell & 1511 - 0.3% Cu shell {dark blue}) and 1520 – Vein {purple}, relative to LG ZN Domains {green}



Section looking north (13600mN left and 14880mN right), showing the Cu domain (coloured blocks), interaction with low grade Zn domain (green wireframe shapes)

- Underground mapping of development drives for both access and ore drives were also used in assisting with the geological interpretation.
- Globally the Dugald River deposit follows a reasonably predictable lens/sheet of mineralisation but with short-range (10m to 20m-scale) variations associated with localised structures that are suitably defined by close-spaced drilling within the Measured Mineral Resources.

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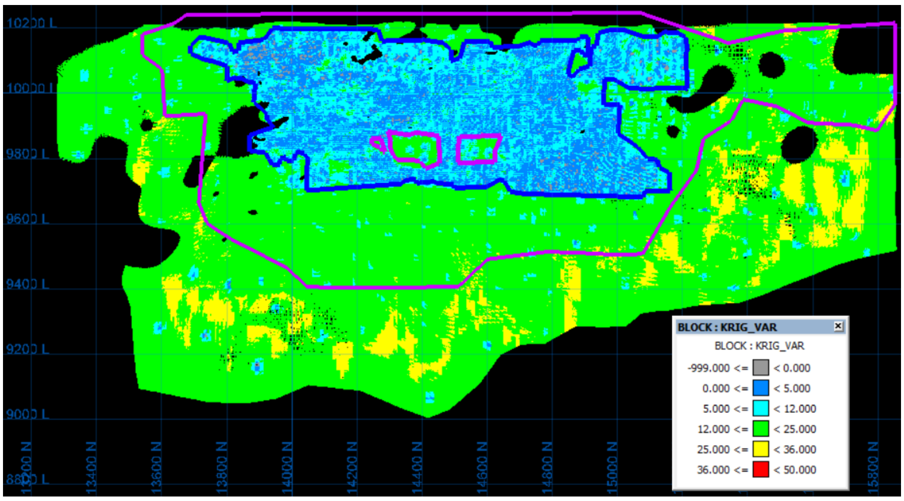
Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Dimensions	• The main Dugald lode (Domain 1) is hosted within a major N-S striking steeply west dipping shear zone which cross cuts the strike of the Dugald River Slate stratigraphy at a low angle. • The strike length of mineralisation is approximately 2,400 m. Dip varies between 85° and 40° to the west. • The true thickness of the majority of the Mineral Resource is between 3 m and 30 m with the thickest zones occurring to the south. • The mineralisation is open at depth. The deepest drill intersection of mineralised material is about 1,140 m below the surface.
Estimation and modelling techniques	• Mineral Resource modelling was completed using both Isatis and Vulcan software applying the following key assumptions and parameters: o Ordinary Kriging interpolation has been applied for the estimation of Zn, Pb, Ag, Mn, Fe, S, total carbon, Cu, Au and Bulk Density. This is considered appropriate for the estimation of Mineral Resources at Dugald River. o Extreme grades were treated by grade capping and were applied after compositing, with values greater than the selected 'cut value' being set to the top cut value and used in the estimation. Grade cap values were selected using a combination of both histogram and cumulative log probability plots. o Grade estimation was performed using a local varying anisotropy (LVA), which aligns and optimises the search direction of the estimate to the mineralised domain trend. o Hard boundary contacts were used to select samples used to estimate blocks in each of the mineralised zinc domains (high-grade and low-grade) as well as into individual domains for Ag, Mn and Pb. Hard boundaries were also used for hanging wall copper domain to estimate Cu and Au. o Variogram were modelled within each of the respective domain, these variogram ranges were then applied to the search parameters used in the estimation. o Orientation of the search ellipse was matched to the lva, that is dip and dip direction at the local block was used in the estimation of the model. o Drillhole compositing resulted in nominal 1m intervals with residual composite intervals absorbed evenly into the composites resulting in no loss of sample intervals. o Separate variography and estimation were performed for Zn, Pb, Ag, Mn, Fe, S, bulk density, Cu, Au and total carbon, within each of their respective mineralised domains. o No assumptions have been made about the correlation between variables. All variables are comparably informed and independently estimated. o Interpolation was undertaken in two stages: ▪ Stage1: Ordinary Kriging applying two passes with varying search ellipse dimensions ▪ First pass is equal to 80 - 100% of the variogram range ▪ Second pass is equal to 2 x variogram range ▪ Stage 2: Assign blocks not estimated by the Ordinary Kriging 2 passes, the median grade of the respective domain.

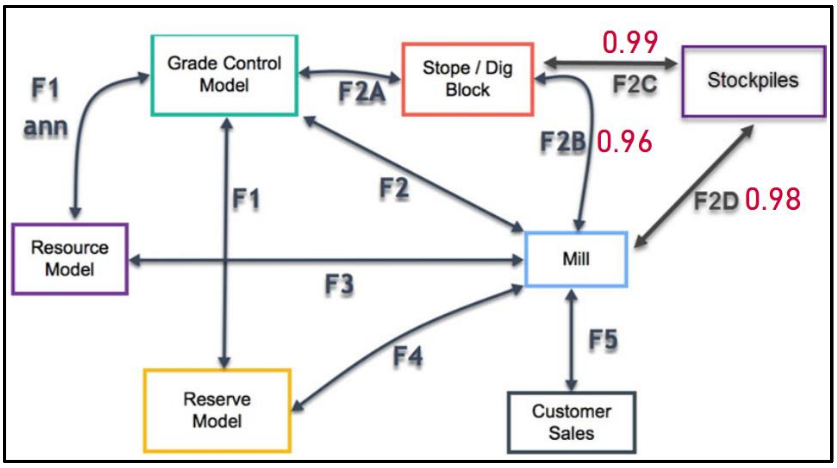
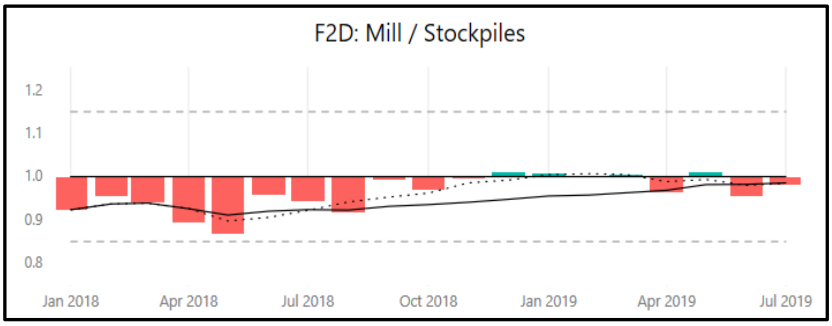
Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	○ A maximum 3 number of sample per drill holes were used for all estimates. ○ Generally, the number of composite samples was restricted to a minimum of 6 and a maximum of 20 to 28 based on Kriging Neighbourhood Analysis (KNA); depending of variables ○ Octant or sector method was generally not applied to the Ordinary Kriging estimate ○ Block discretisation of 2 x 8 x 8 was applied. • Assumptions have been made regarding the recovery of all by-products in the NSR. • Deleterious elements include manganese and carbon, which have been estimated in the block model. Ancillary elements estimated include Mn, Fe and S. • Parent block size was set at 2.5m x 12.5m x 12.5m (xyz) with sub-cells of x=0.5m, y=1.25m, z=1.25m. Sub-cells were assigned parent block values. The parent block size assumes mining selectivity at the stope level. ○ In areas if intense drilling (10 x 20m), the estimate was performed with parent block set to 2.5m x 6.25m x 6.25m (xyz) with sub-cells of x=0.5m, y=1.25m, z=1.25m. Sub-cells were assigned parent block values. This block size is used to better estimate local variance with increased information. ○ Background waste is estimated with parent block size of 10m x 50m x 50m (xyz), this was to reduce the total block model size. • No external dilution has been applied to block grades. However, parent block size has assumed mining selectivity at a stope level. No other selective mining unit size assumptions were made in the estimation process. • 2019 block model validation included the following steps: ○ Comparison against the previous 2018 block model including visual comparison of plans and cross-sections, tonnes grade curves, cumulative probability plots and trend plots. ○ Comparison against drillhole data using visual comparison of plans and cross-sections, statistics by domain, cumulative probability plots and swath plots.
Moisture	• Tonnes in the model have been estimated on a dry basis.
Cut-off parameters	• The Mineral Resource is reported above an A$138/t NSR (net smelter return) cut-off. The selection of the A$138/t NSR cut-off defines mineralisation which is prospective for future economic extraction. The reporting cut-off grade is in line with MMG's policy on reporting of Mineral Resources which is prospective for future economic extraction.
Mining factors or assumptions	• Mining at Dugald River is planned to be underground with the long-hole open stoping method favoured. Currently the deposit is accessed by two declines. • No external dilution has been applied to block grades. However, parent block size has assumed mining selectivity at a stope level. • The Mineral Resource has been depleted to account for mining.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Metallurgical factors or assumptions	• The metallurgy process proposed for the Dugald River deposit involves crushing and grinding followed by floatation and filtration to produce separate zinc and lead concentrates for sale. • Deleterious elements include manganese and carbon, which have been estimated in the block model. • Manganese percentage in the zinc concentrate is calculated as a post-processing step to allow the generation of a value that can be used for the Ore Reserve. • Manganese percentage in the zinc concentrate is calculated by way of an algorithm contained within the NSR script.
Environmental factors or assumptions	• Dugald River operates under Environmental Authority EPML00731213 issued by the Department of Environment Heritage Protection on 12 August 2012 and amended on 16 September 2016. • Non-acid forming (NAF) and Potentially Acid Forming (PAF) waste rock are distinguished by a north-south striking Limestone and Undifferentiated Black Slate lithological boundary respectively. Volumes are estimated and managed in accordance with site procedures. Waste rock storage space on surface is limited. The north mine area will allow for the return of waste rock as backfill and the south mine is backfilled with paste fill generated from tailings. • PAF/NAF classification is based on the work by Environmental Geochemistry International (EGI) in 2010. Subsequent follow-up test work onsite confirms EGI's conclusions.
Bulk density	• Bulk density is determined using the weight in air and water method. Frequency of samples is at least 1 determination per core tray and based on geological domains. The current database consists of 17,943 bulk density measurements. • Dugald River rock is generally impermeable requiring no coatings for reliable measurements. • Bulk density in the model has been estimated using Ordinary Kriging. Density estimation is constrained within the defined mineralisation domains. • Un-estimated blocks were assigned a bulk density value based on a stoichiometric formula (see below). Bulk Density (assigned) = (3.8*A/100) + (7.3*B/100) + (4.6*C/100) + (2.573*D/100) ○ Sphalerite content A = 1.5*Zn% ○ Galena content B = 1.15*Pb% ○ Pyrrhotite/Pyrite content C = (Fe%-(0.15*Zn%))*1.5 ○ Gangue D = 100-A-B-C ○ SG of sphalerite = 3.8 ○ SG of Galena = 7.3 ○ SG of Pyrrhotite/pyrite = 4.6 ○ SG of gangue = 2.573 ○ Fe content in Sphalerite = 10% • A bulk density of 2.75 g/cm^3 has been assumed for the waste host domain.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**

Classification	• 2019 Classification incorporates a combination of Kriging variance (KV), Kriging efficiency (KE), Kriging slope of regression (RS), drilling density and location of underground development (presence of underground geological mapping).
	• Mineral Resource categories are generally based on:
	  ○ Measured: < 20m drill spacing, RS>0.85 plus grade control drilling.
	  ○ Indicated: > 20m to <100m drill spacing, RS<0.6.
	  ○ Inferred: > 100m drill spacing, within mineralised domain
	• The Competent Person reviewed the distribution of KV, KE and RS in long section view and generated three-dimensional wireframes to select Measured, Indicated and Inferred blocks. These wireframes also take into consideration the location of the underground development and presence of geological mapping and the 20 m x 20 m underground drilling. The use of wireframes ensured that contiguous areas of like classification were generated thus avoiding the “spotted dog” pattern of classified blocks.
	• The Mineral Resource classification reflects the Competent Persons view on the confidence and uncertainty of the Dugald River Mineral Resource.
	• Below is a long section looking east of the Dugald River mineralisation lode showing blocks coloured by Kriging variance (KV) and the Measured, Indicated and Inferred wireframes used in selecting the Mineral Resource classification.
	  ○ Measured = Blue Polyline
	  ○ Indicated = Purple Polyline
	  ○ Inferred = Outside Purple Polyline
	
	
	Long-section of the Dugald River Block Model, blocks coloured by KV

Audits or reviews	• External independent audits have been performed in 2019 by AMC Consultant. AMC endorsed 2019 Dugald River Mineral Resource estimate with minor recommendations; which will include in the next Mineral Resource update. • An internal MMG review has been carried on the current 2019 Mineral Resource estimate. This involved personnel from both Corporate and Dugald River sites. No material items to the Mineral Resource have been identified.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Discussion of relative accuracy / confidence	• The Competent Person is of the opinion that the current block estimate provides a good estimate of tonnes and grades on a global scale. In locations where grade control drilling of approximately 10mN x 20mRL spacing has been completed the Competent Person has a high level of confidence in the local estimate of both tonnes and grades. • Since commercial production at Dugald River began 1 May 2018, an effort has been made to monitoring the movement of Tonnes, Grade and Metal as can see in the map below.  **Dugald River Reconciliation Map** • Since the 2019 Resource Model release, tonnes, grade and metal at Dugald River reconciled well between Stope Block vs Stockpile (F2C), Stope Block vs Mill (F2B) and Stockpile vs Mill (F2D); which generally under 5% difference. • In early production, incorrect dilution factor applied; therefore discrepancy in reconciliation noticed. Furthermore, from October 2018 adjusted dilution factor applied and reconciliation improving.  **Grade Reconciliation between Stockpile vs Mill (F2D) showing improvement since October 2018** • Except reconciliations mentioned above, the process and system still under development and will available soon

5.2.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resource statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

5.2.3.1 Competent Person Statement

I, Douglas Corley, confirm that I am the Competent Person for the Dugald River Mineral Resource section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australian Institute of Geoscientists and hold Registered Professional Geoscientist (RPGeo) accreditation.
- I have reviewed the relevant Dugald River Mineral Resource section of this Report to which this Consent Statement applies.

I am a full time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Dugald River Mineral Resource section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Dugald River Mineral Resources.

5.2.3.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Dugald River Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Date: 22/10/2019

Douglas Corley MAIG R.P.Geo. (#1505)

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Rex Berthelsen
Melbourne, VIC

Signature of Witness:

Witness Name and Residence: (e.g. town/suburb)

5.3 Ore Reserves – Dugald River

5.3.1 Results

The 2019 Dugald River Ore Reserve are summarised in Table 15.

Table 15 2019 Dugald River Ore Reserve tonnage and grade (as at 30 June 2019)

Dugald River Ore Reserves							
						Contained Metal	
	Tonnes (Mt)	Zinc (% Zn)	Lead (% Pb)	Silver (g/t Ag)	**Zinc ('000)**	**Lead ('000)**	**Silver (Moz)**
Primary Zinc[1]							
Proved	11.7	10.9	2.0	57	1,281	231	21
Probable	14.1	11.1	1.5	18	1,565	211	8
Total	**25.9**	**11.0**	**1.7**	**36**	**2,845**	**442**	**30**
Stockpiles							
Proved	0.1	10.8	1.8	53	9	1	0.1
Total	**0.1**	**10.8**	**1.8**	**53**	**9**	**1**	**0.1**
Total	**25.9**	**11.0**	**1.7**	**36**	**2,854**	**443**	**30**

[1] Cut-off grade is based on Net Smelter Return (NSR) after Royalties, expressed as a dollar value of A$138/t.

Contained metal does not imply recoverable metal.

The figures are rounded according to JORC Code guidelines and may show apparent addition errors.

5.3.2 Ore Reserves JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 16 complies with the 2012 JORC Code requirements specified by "Table-1 Section 4" of the Code.

Table 16 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Dugald River Ore Reserve 2019

<table>
<tr><th colspan="2">Section 4 Estimation and Reporting of Ore Reserves</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td>Mineral Resources estimate for conversion to Ore Reserves</td><td>

The Mineral Resources are reported inclusive of the Mineral Resources used to define the Ore Reserves.
The Mineral Resources model used the MMG March 2019 Mineral Resources model. (DR_GMR_1903_V3.dm)
Risks associated with the model are related to orebody complexity seen underground, but not reflected in the Mineral Resources model due to the spacing of the drill holes that inform the model.
The 2019 Geotechnical model was used to estimate the hanging wall (HW) thickness, tonnes and grade of the unplanned dilution applied to the 2019 stope shapes.
</td></tr>
<tr><td>Site visits</td><td>

Karel Steyn, the Competent Person for the Dugald River Ore Reserve frequently visited the site during 2018/2019 reporting period.
</td></tr>
<tr><td>Study status</td><td>

The mine is an operating site with on-going detailed Life of Asset planning.
</td></tr>
<tr><td>Cut-off parameters</td><td>

The breakeven cut-off grade (BCOG) and Mineral Resources cut-off grade (RCOG) have been calculated using 2019 Budget costs.
The operating costs, both fixed and variable, have been attributed on a per tonne basis using the planned mine production rate of 1.8Mtpa
The Net Smelter Return (NSR) values are based on metal prices, exchange rates, treatment charges and refinery charges (TC's & RC's), government royalties and metallurgical recoveries.
The NSR value for both BCOG and RCOG is to the mine gate and includes 3 year average sustaining capital for the 2019 Ore Reserves.
Infill diamond drilling has been included as part of the growth capital, not as the sustaining capital.
For 2019 Ore Reserves (OR) and Life of Asset (LoA), the break-even cut-off grade (BCOG) has been used to create the stope and level by level evaluation.

<table>
<tr><th rowspan="2">Category of Cut-off</th><th>Budget 2019</th><th>Av Budget Jul18-Dec20</th><th rowspan="2">Diff</th></tr>
<tr><th>AU$/t processed</th><th>AU$/t processed</th></tr>
<tr><td>BCOG</td><td>138</td><td>146</td><td>-8</td></tr>
<tr><td>SCOG</td><td>121</td><td>128</td><td>-7</td></tr>
<tr><td>DCOG</td><td>73</td><td>74</td><td>-1</td></tr>
<tr><td>ICOG</td><td>61</td><td>79</td><td>-17</td></tr>
<tr><td>MCOG</td><td>25</td><td>33</td><td>-8</td></tr>
<tr><td>RCOG</td><td>138</td><td>146</td><td>-8</td></tr>
<tr><td>TCOG</td><td>152</td><td>155</td><td>-3</td></tr>
</table>
</td></tr>
<tr><td>Mining factors or assumptions</td><td>

A detailed design of the 2019 OR was used to report Mineral Resources conversion to an Ore Reserves.
</td></tr>
</table>

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

	• The 2019 Geotechnical Equivalent Linear Overbreak Slough (ELOS) model was used to estimate the HW thickness, tonnes and grade of the planned dilution applied to the 2019 stope shapes.
	• The orebody is split into a north and south mine, due to its 2 km strike length and a low-grade zone at the extremities of the orebody.
	• The north mine is narrow (average ~5 m true width) and sub-vertical. The south mine is wider than the north mine with a flexural zone in the centre. The south mine is narrow and steep in the upper zone (~top 200 m from surface) and lower zone (~below 700 m from surface). The central zone is flatter and thicker than the upper and lower zones.
	• Mining methods for the mine are Sub-Level Open Stopes (SLOS) in the South Mine and modified Avoca stoping or Core & Shell stopes with rib pillars in the North Mine with a 25m level interval and variable stope strike length of 15 m to 30m.
	• The stopes are broken into the following categories:
	  o Longitudinal SLOS, for stopes upto 10-15m wide horizontally. (Where the orebody has thickened adjacent stopes are mined in sequence after paste filling)
	  o Crown pillar SLOS, for the top level of each panel where stoping occurs directly below a previously mined area.
	  o Modified Avoca stopes/Core & Shell Stopes for the North Mine
	• The stopes were created by applying the Mineable Shape Optimiser (MSO) software in Deswik CAD to the 2019 Mineral Resources model (dr_rese_v3_t_nsr.dm) that was created in Datamine.
	• The parameters used to create the stope shapes were:
	  o All Mineral Resources categories included
	  o 25 m level interval
	  o Variable strike length
	  o Minimum mining width (MMW) of 2.5 m
	  o The minimum dip of 45 degrees for Footwall (FWL) and 37 degrees for Hangingwall (HW)
	  o Minimum waste pillar between parallel stopes of 5m
	  o A$138/t BCOG applied to create initial stope shapes.
	• Several aspects of dilution were considered, planned dilution, fill dilution and HW dilution. Planned dilution was included in the MSO stope shapes and covers localised variations in dip and strike as well as minimum mining width. No additional FW dilution was applied as the initial stope shapes took into account minimum mining widths and dip.
	• The HW dilution was calculated for each stope based on the Geotechnical conditions and thicknesses of the HW materials. The site has compiled a detailed HW dilution model as dilution varies across the ore-body according to the HW conditions.
	• Fill Dilution and Stope Recovery Factors:
	  o Floor 0.15 m, Backs 0.5 m and Wall fill ranges from 1 m to 1.5 m dilution.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	○ Recoveries Longitudinal 95%, Modified AVOCA / Core & Shell with rib pillars 75% and Crown stopes 90%, • Development grades were diluted by the application of a grade factor of 95% to the development grade estimated from the block model. • No Inferred Mineral Resources are included in the Ore Reserves. • The underground (UG) mine is accessed via two separate declines. The mine is split into two – north and south, though both declines are connected via a link drive approximately every 150m vertically -the base of each production Panel. As at 30 June 2019, 7,577m of decline is in place, along with a further 45,810 m of lateral development. • Currently, six raise-bored ventilation shafts have connection to the surface: ○ The southern Fresh Air Raise (FAR) – at 3.5 m diameter and 90m depth; ○ The southern Fresh Air Raise (FAR) – at 5.0 m diameter and 190 m depth; with a120m extension to the 340 level ○ The southern Return Air Raise (RAR) – at 5.0 m diameter and 154 m depth; with a 375m extension (multiple holes) to the 565 level ○ The southern Return Air Raise (RAR) – at 5.0 m diameter and 197 m depth; with a 270m extension (multiple holes) to the 490 level ○ The northern Fresh Air Raise (FAR) at 3.5 m diameter and 165 m depth with a 275m extension (multiple holes) to the 490 level ○ The northern Return Air Raise (RAR) at 5.0 m diameter and 104 m depth with a 310m extension (multiple holes) to the 490 level On each return shaft collar there is an exhaust fan drawing approximately 270-300m^3/s. • There is also a secondary RAR system in the north and south mines comprising of LHW and 3.0-3.5m raisebored holes that have connections to each production level where there is access. • Secondary egress is provided by link drives between the South & North declines. These link drives are positioned at the base of each production Panel. An additional internal ladderway exists in the South mine between the 50 and 200 Levels. • Mining mobile fleet is planned to include 3 twin-boom jumbos, 1 cable bolting rigs, 6 loaders, 9 dump trucks, 3 long-hole drill rigs, 2 shotcrete rigs, 2 Transmixers, 2 charge-up vehicles, 3 integrated tool carriers, and light vehicle fleet.
Metallurgical factors or assumptions	• The metallurgical process for treatment of Dugald River ore involves crushing and grinding followed by selective flotation to produce separate lead and zinc concentrates. This process is conventional for this style of mineralisation and is used worldwide. • The flow sheet was extensively tested at bench scale with over 200 tests being completed on a wide range of samples. • Locked cycle testing, as a way to assess the continuous run in a laboratory scale, was performed on five different samples. The results were favourable, and are summarised in Table 21 below.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

Results of locked cycle testing

Sample	Pb Conc, % Pb		Pb Rec, %		Zn Conc, % Zn		Zn Rec, %	
	OCT	LCT	OCT	LCT	OCT	LCT	OCT	LCT
2014 bulk sample	61.2	59.6	67.7	79.5	55.6	52.5	88.8	92.8
DU0209	56.0	53.8	68.6	81.7	52.1	52.2	87.6	88.7
DU0279	61.4	65.3	69.5	89.6	50.8	51.4	87.0	89.0
DU0275	54.6	47.0	51.1	72.8	50.0	52.1	86.8	87.8
2015 bulk sample	61.9	46.5	52.2	73.7	54.8	52.1	89.7	91.7
Average	59.0	54.4	61.8	79.5	52.6	52.1	88.0	90.0

- Two separate plant trials were conducted for processing of Dugald River ore, using the existing facilities at the Century processing plant. 458,000 tonnes of Dugald River ore was processed during the trials. The results obtained from these plant trials were incorporated into the final plant design.
- The Dugald River processing facility was commissioned with production commencing in October 2017, with nameplate throughput reached after 7 months of operation (May 2018). Both lead and zinc concentrate produced at Dugald River meet saleable grade and impurity specifications.
- Dugald River plant operating data has been analysed to establish the metallurgical factors used for Ore Reserve calculations. Key parameters are:
- Lead Concentrate Grade Pb% = 63.0%
- Lead recovery to a lead concentrate according to the equation: Pb recovery Pb Conc (%) = 49.4 + 10.2 X Pb%
- Silver recovery to a lead concentrate according to the equation: Ag recovery Pb Conc (%) = 0.5746 x Pb recovery Pb Conc
- Zinc Concentrate Grade Zn% = 50.8%
- Zinc recovery to a zinc concentrate according to the equation: Zn recovery Zn Conc (%) = $\frac{([100 - \text{ZnLoss PFConc} - \text{ZnLoss PBConc}] \text{x Zn Recovery Constant ZnConc})}{100}$

  Where;
- ZnLossPF Conc = -29.16 + 1.1216 X C% + 0.4557 x Fe% + 0.2655 x SiO2% + 0.2854 x Zn% + 0.2039 x C RecoveryPFConc
- C Recovery PFConc = 60
- ZnLoss PB Conc = -1.591 + 7.7215 x Pb%/Zn% + 0.0287 x Pb Recovery PB Conc
- Zn Recovery Constant Zn Conc = 94.7%*
- Plant operating data from May to July 2018 indicates the Zn Recovery Constant Zn Conc was 91%. The increase to 94.7% reflects the expected improvement in recovery as the plant is optimised post ramp up.
- Ag Recovery Zn Conc = $\frac{[100 - \text{AgLoss PF Conc} - \text{Ag Recovery PbConc}] \text{ x Ag RecoveryConstant Zn Conc}}{100}$

  Where;
- AgLossPF Conc = 1.71 + 1.137 x ZnLoss% PF Conc

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• AG Recovery Constant Zn Conc = 6.966 x e(0.0234 x ZnRecovery Constant Zn Conc) • Where; Zn%, Pb%, Fe%, Mn%, C% and SiO2% refer to the relevant assays of the ore • A full check has been completed for possible deleterious elements, and the only two that are material to economic value are Fe and Mn in the Zn concentrate. It is for this reason that the algorithms to predict these components have been developed using Dugald River operating data: • Iron assay of zinc concentrate according to the equation: % Fe in Zn concentrate $= \frac{6.4357+0.4918 \text{ x } (3.7885 \text{ x Mn } \%)}{0.72}$ • Manganese assay of zinc concentrate according to the equation: % Mn in Zn concentrate = 3.7885 x Mn%
Geotechnical	• Ground conditions at Dugald River are generally good to fair with isolated areas of poor ground associated with shear zones and faults. • Development ground support at this stage in the mine life of Dugald River focuses on static stability requirements with surface support matched to the ground conditions, e.g. mesh for good ground/ short design life and Fibrecrete for poor ground and long-term design life (e.g. decline). • Stope stability is strongly influenced by the presence and proximity of hangingwall shear zones which are associated with very poor ground conditions. • The trial stoping conducted at Dugald was used to calibrate the geotechnical stope dilution model from which guidance on stope dimensions (strike/ hydraulic radius) and estimates of stope dilution could be made. • The life of mine mining sequence is modelled using MAP3D (a linear-elastic method) to provide guidance on favourable sequences that will minimise the adverse effects of induced stress.
Environmental	• Dugald River operates under Environmental Authority EPML00731213 issued by the Department of Environment, Heritage Protection on 12 August 2012 and amended on 7 June 2013. • Non-Acid Forming (NAF) and Potentially Acid Forming (PAF) waste rock are distinguished by a north-south striking Limestone and Undifferentiated Black Slate lithological boundary respectively. Volumes are estimated and managed by site procedures. With limited stockpile space on the surface, all PAF waste rock is stored temporarily on the surface but used as rockfill underground with only NAF waste rock stored on the surface. • The north mine area uses waste rock as backfill, and the south mine backfilled with paste fill generated from tailings.
Infrastructure	• Currently, the DR mine is operating via an electricity grid. Northwest Queensland is now connected to the state electricity grid, feed on Mica Creek gas-fired power station on the southern outskirts of Mount Isa.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• Gas for the power station is supplied via the Carpentaria pipeline, with a compression station in Bellevue. • Based on the current production schedule, DR site manning numbers peak at 530 people in 2022. Cloncurry airport is used by commercial and charter airlines flying to and from Townsville, Cairns and Brisbane and operates as both a commercial and fly-in–fly-out (FIFO) airport. • Existing surface infrastructure includes: • An 11 km sealed access road from the Burke Developmental Road, which includes an emergency airstrip for medical and emergency evacuation use; • Permanent camp & recreational facilities; • Telstra communication tower • Ore and waste stockpile pads; • Contaminated run-off water storage dams; • Office & change house facilities; • Office buildings, including emergency medical facilities; • Core shed; • Fuel storage facilities • Bore water fields and raw water supply lines; • Processing plant, • Paste Plant, • Tailings storage facility, • Mobile equipment workshop • UG Ventilation Exhaust Fans x 3
Costs	• The estimation of capital cost for the Dugald River project was derived from first principles in the 2019 LoA schedule and is to be refined through operation reviews. • The MMG commercial department estimated the mining operating costs for the OR evaluation using first-principles. Costs were inclusive of Operating and Sustaining Capital. Costs are in Australian dollars and are converted to US dollars at the applicable exchange rate. • Deleterious elements Mn (and to a lesser extent Fe) are to be controlled by metallurgical blending. It is expected that the feed for flotation will be blended to maintain Mn (and to a lesser extent Fe) within the contractual range for concentrate sales and thus not expected to attract additional costs and penalties. • The MMG finance department supplies the commodity price assumptions. The Dugald River Ore Reserve applied the January 2019 guidance. • The long-term exchange rate used the January 2019 Long-Term MMG guidance and assumptions supplied by the MMG Business Evaluation department.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The road freight and logistics for domestic and export sales have been updated using the costs from the 2019 budget. The additional costs for storing and ship loading of concentrate in Townsville are included. For the 2019 Ore Reserves, the storage and ship loading cost has been added to the freight and logistics cost for export. The freight and logistics costs for the domestic sale of concentrate includes the sea freight cost based on an agreement with Sun Metals. • Treatment and refining charges are based on MMG's estimate as contracts currently under review. • Queensland State Government royalties payable are prescribed by the Minerals Resources Regulation 2013 and are based on a variable ad valorem rate between 2.5% to 5.0% depending on metal prices. Freehold leases have been identified and applied to production that falls within them.
Revenue factors	• Realised Revenue Factors (Net Smelter Return after Royalty) • As part of the 2019 Ore Reserves process, the net smelter return (after royalty) (NSR) has been revised with the latest parameters and compared against the previous 2018 NSR calculation that was used for the 2018 Ore Reserve. • The NSR is used to convert the various zinc, lead and silver grades into a single number for cut-off estimation and determining if the rock is ore or waste. • Treatment and refining charges, royalties and transportation costs for different commodities were supplied by MMG Group Finance and have been included in the NSR calculation. • The MMG Group Finance department provides assumptions of commodity prices and exchange rates and are based on external company broker consensus and internal MMG analysis.
Market assessment	• Although the rate of growth of global zinc consumption is slowing, demand is still expected to increase modestly over the medium term, with growth mainly coming from China the world's developing nations. • Stocks of refined zinc are currently at historically low levels after several years of market deficits due to limited mine production and concentrate availability. • Zinc mine production has now recovered but, there is uncertainty surrounding future new supply, while there is also limited growth in new smelting capacity. Increasingly stringent environmental regulations in China also restrict supply growth in that region. • New projects tend to be more economically challenging than existing or recently closed operations due to a range of factors including grade, size and location. • The combination of current low stocks, modest demand growth prospects and limitations on future supply should be supportive of the zinc price over the medium term. • Dugald River zinc concentrate has been well accepted by the market and there are long term contracts in place for supply to smelters in Asia and Australia. These arrangements will underpin sales of the concentrate in future years.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Economic	• Economic modelling of the total mining inventory shows positive annual operating cash flows. Applying the revised costs, metal prices and exchange rate (MMG January 2019 Long-Term economic assumptions) returns a positive NPV. MMG uses a discount rate supported by MMG's Weighted Average Cost of Capital (WACC) and adjusted for any country risk premium (as applicable) based on an internal evaluation of the country risk for the location of the deposit. • All evaluations were done in real Australian (AU) dollars.
Social	• The nearest major population centre for the Mine is Cloncurry with a population of approximately 4,000, and the largest employers are mining, mining-related services and grazing. • Regarding Native Title, the Kalkadoon # 4 People filed a claim in December 2005 covering an area which includes the project area, water pipeline corridor and part of the power line corridor. This claim over 40,000 square kilometres of land was granted in 2011. • MMG has concluded a project agreement with the Kalkadoon People dated 6 April 2009. Under this agreement, the claimant group for the Kalkadoon are contractually required to enter into an s31 Native Title Agreement under the Native Title Act 1993. The agreement sets out the compensation payments and MMG's obligations for training, employment and business development opportunities if/when the project is commissioned. MMG has developed an excellent working relationship with the Kalkadoon claimant group. MMG has instituted the MMG/KCPL Liaison Committee, which meets at least twice yearly and addresses the Kalkadoon agreement obligations for both parties. An official 'Welcome to Country' ceremony was held for MMG in late March 2012. • The Mitakoodi and Mayi People filed a claim in October 1996 and covered an area that includes part of the power line corridor. While the Mitakoodi have not yet been granted Native Title, MMG continues to liaise with them as a stakeholder due to the 'last claimant standing' legal tenement. • MMG has registered an Indigenous Cultural Heritage Management Plan (CHMP) which covers the entire project area and has undertaken all necessary surveys and clearances for all disturbed groundwork undertaken on site to date without any issues or complications. The CHMP was developed in consultation with the Kalkadoon # 4 People.
Other	• There is no identified material naturally occurring risks. • The legal agreements are in place. There are no outstanding material legal agreements. • The grade of the zinc concentrate is dependent on the Fe and Mn content of the sphalerite, but this dependence is taken into account by the algorithms presented earlier. • The government agreements and approvals are in place. There are no unresolved material matters on which the extraction of the Ore Reserves is contingent.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Tailings	• The Dugald River Tailings Storage Facility (TSF) has been modified from the previously proposed design to align with changes in mine production profiles and paste fill requirements. • The new design proposes integrated tailings, and process water facility continues to supply a large portion of the site's annual processing water demand via the Decant Return system. • It proposed that the peak operational throughput of the processing plant now be 2.0 Mtpa, with an average of 35% of the tailings being sent to paste and the remaining 65% thickened to a solids density of 40% solids. Previous assumptions saw peak mill throughput peak at 1.5 Mtpa for the modelled base case and 1.75 Mtpa for the upside case. • The water balance model was run to identify the likely water volumes needing to be managed within the integrated facility and to provide an indication as to the likely rates that may need to supply from the Lake Julius pipeline. • The table below shows the tailing storage required for the High Case that includes the capacity required for 2018 Ore Reserves.
Classification	• Ore Reserves are reported as Proved and Probable. • Only Measured (22%) and Indicated (35%) Mineral Resources have been used to inform the Proved and Probable Ore Reserves. No Inferred Mineral Resources are included in the Ore Reserves.
Audits or reviews	• No external audits have been undertaken for the 2019 Ore Reserves. MMG personnel have been involved in reviewing the Ore Reserves process. • An External Review and Audit was carried out for the 2018 Ore Reserves.

TAILINGS PRODUCTION & REQUIRED TSF CAPACITY

Design Topic	Criterion	Value
Production Data	Total Resource (Milled Ore)	38.2 Mt
	Life of Asset (LoA)	27 years
	Total Tailings Production	28.5 Mt
	Proportion of Tailings to Underground Paste Backfill	62%
TSF Capacity	Total Tailings to TSF	10.9 Mt
	Design TSF Tailings Capacity	12.6 Mt

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Discussion of relative accuracy/confidence	• Ore Reserves Risks that may materially change/effect; • The geological understanding of the grade continuity concerning diamond drill spacing. • The geotechnical risk associated with hanging-wall instability and mining dilution. • Mining infrastructure analysis requires further work on underground trucking, ventilation and power constraints. • Metallurgical risks (recovery and concentrate grades) require additional testing to confirm scale up reliability, metallurgical performance and reagent consumption. • Close spaced drilling is applied to a locally defined tonnage and grade before mining selection. Ore Reserves are based on all available relevant information. • Ore Reserves accuracy and confidence that may have a material change in modifying factors are discussed above.

5.3.3 Expert Input Table

Some persons have contributed vital inputs to the Ore Reserves determination. These are listed below in Table 17.

In compiling the Ore Reserves, the Competent Person has reviewed the supplied information for reasonableness but has relied on this advice and information to be correct.

Table 17 Contributing Experts – Dugald River Ore Reserves

EXPERT PERSON / COMPANY	AREA OF EXPERTISE
Douglas Corley, Geology Manager AAA, MMG Ltd (Melbourne)	Geological Mineral Resources
Claire Beresford Senior Analyst Business Evaluation, MMG Ltd (Melbourne)	Economic assumptions
Steve Whitehead, General Manager Marketing, MMG Ltd (Melbourne)	Marketing, sea freight and TC/RC
Nigel Thiel, Principal Metallurgist, MMG Ltd (Melbourne)	Metallurgy
Angus J Henderson, Snr Manager Commercial & Business Support, MMG Ltd (Australian Operations)	Mining capital and operating costs
Ben Small, Senior Geotechnical Engineer, MMG Ltd (Dugald River)	Geotechnical
Peter Willcox, Senior Mining Engineer – Long Term Planning, MMG Ltd (Dugald River)	Mining parameters, cut-off estimation, mine design and Scheduling
Jonathan Crosbie, Group Manager - Closure & Remediation MMG Ltd (Melbourne)	Mine closure and remediation

5.3.4 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Ore Reserves statement has been compiled by the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

5.3.4.1 Competent Person Statement

I, Karel Steyn, confirm that I am the Competent Person for the Dugald River Ore Reserves section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having more than five years experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australasian Institute of Mining and Metallurgy
- I have reviewed the relevant Dugald River Ore Reserves section of this Report, to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimate.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Dugald River Ore Reserves section of this Report is based on and reasonably and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Dugald River Ore Reserves.

5.3.4.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code, 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Dugald River Ore Reserve - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

22/10/2019

Karel Steyn MAusIMM (#309192)

Date:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Rex Berthelsen
Melbourne, VIC

Signature of Witness:

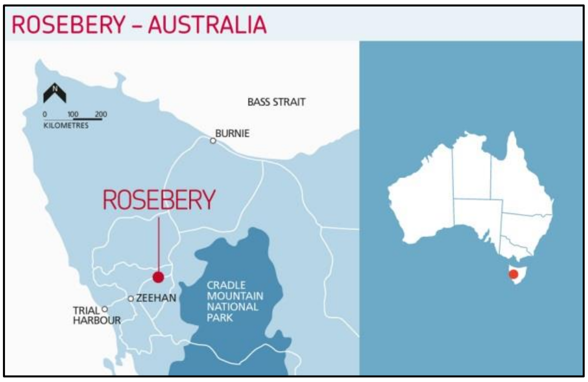
Witness Name and Residence: (e.g. town/suburb)

6 ROSEBERY

6.1 Introduction and Setting

The Rosebery base and precious metals mining operation is held by MMG Limited and is located within Lease ML 28M/1993 (4,906ha), on the West Coast of Tasmania approximately 120km south of the port city of Burnie (Figure 6-1). The main access route to the Rosebery mine from Burnie is via the B18 and the Murchison Highway (A10).

Figure 6-1 Rosebery Mine location



The Rosebery Operation consists of an underground mine and surface mineral processing plant. The mining method uses mechanised long-hole open-stoping with footwall ramp access. Mineral processing applies sequential flotation and filtration to produce separate concentrates for zinc, lead and copper. In addition, the operation produces gold/silver doré bullion. Rosebery milled approximately 1Mt of ore for the year ending 30 June 2019.

6.2 Mineral Resources – Rosebery

6.2.1 Results

The 2019 Rosebery Mineral Resources are summarised in Table 18. The Rosebery Mineral Resources is inclusive of the Ore Reserves.

Table 18 2019 Rosebery Mineral Resources tonnage and grade (as at 30 June 2019)

Rosebery Mineral Resources											
							Contained Metal				
Rosebery[1]	Tonnes (Mt)	Zinc (% Zn)	Lead (% Pb)	Copper (% Cu)	Silver (g/t Ag)	Gold (g/t Au)	**Zinc ('000 t)**	**Lead ('000 t)**	**Copper ('000 t)**	**Silver (Moz)**	**Gold (Moz)**
Measured	6.1	8.3	2.9	0.20	109	1.3	505	176	12	21.5	0.3
Indicated	3.1	7.0	2.4	0.18	92	1.3	215	75	5	9.2	0.1
Inferred	7.3	8.9	3.1	0.33	100	1.5	655	224	24	23.5	0.4
Total	**16.6**	**8.3**	**2.9**	**0.25**	**102**	**1.4**	**1,376**	**474**	**42**	**54.2**	**0.7**
Stockpiles											
Measured	0.01	9.8	2.7	0.29	79	0.9	1.1	0.3	0.03	0.03	0.0
Total	**0.01**	**9.8**	**2.7**	**0.29**	**79**	**0.9**	**1.1**	**0.3**	**0.03**	**0.03**	**0.0**
Total Rosebery	**16.6**	**8.3**	**2.9**	**0.25**	**102**	**1.4**	**1,377**	**475**	**42**	**54.2**	**0.7**

[1]Cut-off grade is based on Net Smelter Return (NSR), expressed as a dollar value of A$165/t
Figures are rounded according to JORC Code guidelines and may show apparent addition errors.
Contained metal does not imply recoverable metal.

6.2.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 19 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 19 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Rosebery Mineral Resources 2019

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sampling techniques	• Diamond drilling (DD) was used to obtain an average 1m sample that is half core split, crushed and pulverised to produce a pulp (>85% passing 75µm). • DD core is selected, marked and ID tagged for sampling by the logging geologist. Sample details and ID are stored in the SQL database for correlation with returned geochemical assay results. • Prior to May 2016, pulps were delivered to the ALS laboratory in Burnie, Tasmania for XRF analysis. Post May 2016 half core samples are delivered to the ALS laboratory in Burnie for sample preparation and XRF analysis. Analysis moved to the ALS Townsville laboratory in October, 2016. • There are no inherent sampling problems recognised. • Measurements taken to ensure sample representivity include sizing analysis and duplication at the crush stage.
Drilling techniques	• The drilling type is diamond core drilling from underground using single or double tube coring techniques. As of January 2014, drill core is oriented on an ad hoc basis. • Drilling undertaken from 2012 is LTK48, LTK60, NQ, NQ2, NQTK, BQTK and BQ in size. Additional drilling in the reporting period is NQ2. • Historical (pre-2012) drillholes are a mixture of sizes from AQ, LTK (TT), BQ, NQ, HQ and PQ.
Drill sample recovery	• Diamond drill core recoveries average 96%. Drill crews mark and define lost core intervals with blocks. Sample recovery is measured and recorded in the drillhole database. If excess core loss occurs in a mineralised zone the hole is re-drilled. • The drilling process is controlled by the drill crew and geological supervision provides a means for maximising sample recovery and ensures suitable core presentation. No other measures are taken to maximise core recovery. • There is no observable correlation between recovery and grade. • Preferential loss/gains of fine or coarse materials are not significant and do not result in sample bias as the nature of mineralisation is massive to semi-massive sulphide, diamond core sampling is applied, and recovery is very high.
Logging	• 100% of diamond drill core has been geologically and geotechnically logged to support Mineral Resources estimation, mining and metallurgy studies. • Geological and geotechnical logging is mostly qualitative (some variables are quantitative). Logging is undertaken using laptop computers which store data directly to the drillhole database. • All drill core is photographed, with photos labelled and stored on the Rosebery server.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sub-sampling techniques and sample preparation	• All samples included in the Rosebery Mineral Resources estimate are from diamond drill core. Drill core is longitudinally sawn to give half-core samples within intervals directed by the logging geologist. The remaining half-core is kept and stored in the original sample tray. Un-sampled core is now stored; prior to 2014 the un-sampled core was discarded. The standard sampling length is one metre with a minimum length of 40cm and maximum of 1.5m. • From 2005 until 2010 geological samples have been processed in the following manner: Dried, crushed and pulverised to 80% passing 75µm. Sizing analysis is carried out on 1:20 pulps. • From 2010 until 2016 geological samples have been processed in the following manner: Dried, crushed to 2mm; cone split to give primary and duplicate samples with the remainder rejected. Pulverised to 80% passing 75µm. Sizing analysis is carried out on 1:20 pulps. Samples despatched to ALS Burnie. • From 2016 geological samples have been processed in the following manner: Dried, crushed to 25mm, pulverised to 85% passing 75µm. Sizing analysis is carried out on 1:20 pulps. Samples are generally not split prior to pulverisation provided they weigh less than 3.5kg. The resulting pulps are bagged, labelled and boxed for despatch to ALS Brisbane and ALS Townsville. • From late 2018 samples have been processed in the following manner: Dried, primary crushed to 6mm then secondary crushed to 3.15mm, pulverised to 75µm. Sizing analysis is carried out on 1:20 pulps. Samples are generally not split prior to pulverisation provided they weigh less than 3.5kg. The resulting pulps are bagged, labelled and boxed for despatch to ALS Brisbane and ALS Townsville. • Sample representivity is checked by sizing analysis and duplication at the crush stage. • The sample types, nature, quality and sample preparation techniques are considered appropriate for the style of the Rosebery mineralisation by the Competent Person.
Quality of assay data and laboratory tests	• From 2005 until 2010 the assay methods undertaken by ALS Burnie for Rosebery were as follows: • 3-Acid Partial Digest (considered suitable for base metal sulphides). • Analysis of Pb, Zn, Cu, Ag, Fe by Atomic Absorption Spectrometry (AAS). • Au values are determined by fire assay. • From 2010 until 2016 the assay methods undertaken by ALS Burnie for Rosebery were as follows: • Dried, crushed to 2mm; cone split to give primary and duplicate samples with the remainder rejected. Pulverised to 80% passing 75µm. • Despatch to ALS Burnie. • Analysis of Pb, Zn, Cu and Fe by X-Ray Fluorescence (XRF) applying a lithium borate oxidative fusion (0.2g sub-sample charge). • Analysis of Ag by aqua regia digest and Atomic Absorption Spectrometry (AAS) (0.4g sub-sample charge).

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• Analysis of Au by fire assay, three acid digest and flame assay AAS (30g sub-sample charge). • From 2016 the assay methods undertaken by ALS Brisbane and Townsville Rosebery were as follows: • Analysis of Ag, Zn, Pb, Cu and Fe by four acid ore grade digest, ICPAES finish with extended upper reporting limits (ALS Brisbane). In addition to these main elements, another 29 elements are reported as a part of this method. • Analysis of Au by fire assay, three acid digest and flame assay AAS (30g sub-sample charge) (ALS Townsville). • All of the above methods are considered effectively total and suitable for Mineral Resources estimation at Rosebery. • The employed assay techniques are considered suitable and representative; a comparison study using the Inductively Coupled Plasma (ICP) technique was completed to check the XRF accuracy in May 2013. Independent umpire laboratory ICP re-assay of 5% pulps took place in June 2015 and May 2016 using the Intertek laboratory in Perth. Pulps for analysis were randomly selected from a list of samples where (Pb + Zn)>5%. • No data from geophysical tools, spectrometers or handheld XRF instruments have been used for the estimation of Mineral Resources. • ALS laboratory Brisbane and Townsville releases its QAQC data to MMG for analysis of internal ALS standard performance. The performance of ALS internal standards appears to be satisfactory, with several standards used within the range of MMG submitted samples. • MMG routinely insert: • Matrix-matched standards, dolerite blanks and duplicates at a ratio of 1:20 to normal assays. • Blanks are inserted to check crush and pulverisation performance. • Duplicates are taken as coarse crush and pulp repeats. • An umpire laboratory (Intertek Perth) is used to re-assay 5% of ore-grade pulps returned from the ALS laboratory. Analysis of routine sample results and control sample performance is reported quarterly. • QA/QC analysis has shown that: • The 18 series standards have seen an increase in Au failures, specifically for LBM-18. An investigation by ALS in October identified the reducing potential was being over-estimated. To counteract this, MMG approved that ALS could wait for sample sulphur results before testing for Au allowing them to put the appropriate level of oxidising agent in to each sample. This change implemented in November saw a decrease in LBM-18 failures in December to approximately 6%, down from 15%, which has been maintained in January and February of 2019. • During a visit to ALS Burnie Laboratory in July 2018, the crushed sample size was observed to exceed the specified 6mm, therefore a test to check the size of the pulp material was conducted on pulp residue material from batches submitted in late May

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	to June 2018. The test work shows there is clearly an issue with pulverising Rosebery samples at the Burnie Laboratory. While most samples met the criteria 85% passing 75µm, many contain oversize particles up to and exceeding the 6mm criteria of the primary crush. • An investigation by ALS found several issues including a mix up with the jaw crusher settings and that calico bags containing crushed sample weren't being completely turned inside out when emptying into the pulverisers resulting in some material being caught in the corner of the bags and not being pulverised. As a result, a number of subsequent changes have been made to the sample protocol and also installing a Boyd crusher at the Burnie lab in November 2018, after a detailed analysis of the sampling nomogram identified the existing protocol was not suitable for the Rosebery material. • Pulp duplicates have performed better than crush duplicates in all elements for the 2018 as expected, except for Au pulp duplicates. Repeatability is consistent for all pulp and crush duplicates with all elements within 5% difference from their original samples (except for Au crush). Coefficient of variation (CV) and R2 values indicate that Au crush and pulp and Ag crush duplicates show the least amount correlation, somewhat can be contributed to the nuggetty nature of these elements. • The failure to crush the Rosebery samples to the required specification, 85% passing 6mm, clearly had an impact on the average CV for the crush duplicates since the start of 2018. Since the changes to the preparation were implemented in July 2018 the monthly average CV% of crush duplicates have significantly decreased, suggesting that changes are having a positive impact. The impact on the overall chemical analysis is mostly mitigated due to the entire sample needing to be pulverised prior to digestion. This impact is demonstrated by the pulp duplicate data where a change in the pulp duplicate average CV% values is less significant than in crush duplicates since the changes implemented at the Burnie lab. • Blanks performed well in 2018 up until November/December where increase in the number fails occurred for Zn and Pb. This coincided with installation of the Boyd crusher at ALS Burnie and has since been rectified.
Verification of sampling and assaying	• All mineralised intersections, are viewed and verified by numerous company personnel by comparing assay results to core photos and logging. • Batches of sampling and assay data are entered by geologists; the performance of duplicates, blanks and standards is checked by the Mine Project Geologist after each assay batch is loaded to the database; batches with failed standards are flagged and pertinent samples are sent for re-assay. • Close twinning of mineralised intersections is not an intentional part of the delineation. However, the underground drill pattern often achieves a near-twinning or scissoring and this confirms individual intersections. • Re-assayed data, due to the failure of a standard, is reviewed to determine which batch is to be used for data export and Mineral Resources estimation. Batch status is recorded in the database for audit purposes. • Database validation algorithms are run to check data integrity before data is used for interpretation and Mineral Resources modelling.

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• Unreliable data is flagged and excluded from Mineral Resources estimation work. Data validation macros are used to identify data errors which are either rectified or excluded from the estimation process. • Since August 2014 all data below detection limit is replaced by half detection limit values. Prior to this date, the full detection limit was used. • No adjustments have been made to assay data – if there is any doubt about the data quality or location, the drillhole is excluded from the estimation process.
Location of data points	• Historically diamond drillholes have been surveyed using magnetic single shot surveys at intervals between 20-30m • A downhole gyro measurement has been recorded from selective drillholes prior to March 2014 as an independent check of downhole survey accuracy. Analysis suggested the single shot surveys are accurate to 100m drillhole depth, and then diverge up to 4m at 400m depth. Given this outcome, gyro downhole surveys are now standard for all diamond holes. • Prior to March 2018, all diamond drillholes were downhole surveyed using a single-shot Reflex Ezi-shot tool at 30m intervals, with a full downhole Reflex gyro survey completed at end of hole by the drilling contractor. Where a gyro downhole survey is not practicable due to equipment limitations, then a multi-shot survey was completed. • Since March 2018, all diamond drillholes are downhole surveyed using a Champ Gyro north seeking tool which is used as a north-seeking tool for drillholes outside of the range between -20^0 and $+20^0$. For holes between -20^0 and $+20^0$ drill holes are surveyed in the continuous mode (gyro using design azimuth for collar dip & azimuth). • Selected surface exploration drillholes have been downhole surveyed using a SPT north seeking gyro (parent holes only). • Collar positions of underground drillholes are picked up by Rosebery mine surveyors using a Leica T16. Collar positions of surface drillholes are picked up by surveyors using differential GPS. Historically, surface drillhole collar locations were determined using a theodolite or handheld GPS. • Grid system used is the Cartesian Rosebery Mine Grid, offset from Magnetic North by 23.84° (as at July 1st, 2019) with mine grid origin at: MGA94 E= 378981.981, N= 5374364.125; mine grid relative level (RL) equals AHD + 1.490m + 3048.000m. • Topographic data derived from regular LIDAR overflights are carried out and correlated with surface field checks to confirm relativity to MGA and Rosebery Mine Grid.
Data spacing and distribution	• The Rosebery mineral deposit is drilled on variable spacing dependent on lens characteristics and access. Drill spacing ranges from 40m-60m to 10m-25m between sections and vertically. The final drill pattern varies somewhat due mostly to site access difficulties in some areas. Mineralisation has short scale structural variations observable in underground workings. Some of this variation is not discernible from drill data alone. Observations of mineralisation geometry are made by traditional geological mapping and more recently using photogrammetry images of mine

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	development faces and backs. All ore drives and most non-ore development headings are covered. • The combination of drill and other data is sufficient to establish the degree of geological and grade continuity appropriate for Mineral Resources and Ore Reserves estimation and the classifications applied. • DD samples are not composited prior to being sent to the laboratory however the nominal sample length is generally 1m. Reverse circulation drill samples are not used for Mineral Resources estimation.
Orientation of data in relation to geological structure	• Drillhole orientation is planned orthogonal to lens strike in vertical, radial fans. Drill fan spacing and orientation is planned to provide evenly spaced, high angle intercepts of the mineralised lenses where possible, thus minimising sampling bias related to orientation. Some drill intersections are at low angle to the dipping mineralisation due to access limitations. • Where drillholes from surface or older holes longer than 400m exist, attempts are made to confirm mineralised intercepts by repeat drilling from newly developed drives. Deep drill intersections are excluded from Mineral Resources modelling where duplicated by shorter underground drillholes. • Drilling orientation is not considered to have introduced sampling bias.
Sample security	• Measures to provide sample security include: o Samples are stored in a locked compound with restricted access during preparation. o Half-core samples for despatch to ALS Burnie are stored in sealed containers with security personnel at the MMG mine front gate for pick-up by ALS courier. o Receipt of samples acknowledged by ALS by email and checked against expected submission list. o Assay data returned separately in both spreadsheet and PDF formats.
Audit and reviews	• Coffey Mining Pty Ltd completed an audit of the core sample preparation area in April 2013. Key results are included in the 'Quality of assay data and laboratory tests' section above. • Several internal audit of the ALS Burnie, ALS Brisbane and ALS Townsville facilities were undertaken during the reporting period by MMG representatives. The sample preparation issue identified at ALS Burnie (mentioned above) has be rectified and no material issues were identified during the inspections. Historically, any issues identified have been rectified.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Mineral tenement and land tenure status	• Rosebery Mine Lease ML 28M/1993 includes the Rosebery, Hercules and South Hercules polymetallic mines. It covers an area of 4,906 ha. • ML28M/93 located was granted to Pasminco Australia Limited by the State Government of Tasmania in May 1994. This lease represents the consolidation of 32 individual leases that previously covered the same area. • Tenure is held by MMG Australia Ltd for 30 years from 1st May 1994. • Lease expiry date is 1st May 2024. • The consolidated current mine lease includes two leases; (consolidated mining leases 32M/89 and 33M/89). These were explored in a joint venture with AngloGold Australia under the Rosebery Extension Joint Venture Heads of Agreement. This agreement covered two areas, one at the northern and the other at the southern end of the Rosebery Mine Lease, covering a total of 16.07 km^2. • The joint venture agreement was between the EZ Corp of Australia (now MMG Rosebery Mine) and Shell Company of Australia Limited (now AngloGold Australia Metals Pty. Ltd., formerly Acacia Resources (formerly Billiton)). A Heads of Agreement was signed on 16th May 1988 with initial participating interest of 50% for each party. Other partners in the joint venture are Little River Resources Ltd. and Norgold Ltd. They have a combined net smelter return royalty of 2.3695%, payable on production from the Rosebery Extension Joint Venture area. AngloGold withdrew from the joint venture on the 31st December 2001. • There are no known impediments to operating in the area.
Exploration done by other parties	• Tom Macdonald discovered the first indication of mineralisation in 1893 when he traced alluvial gold and zinc-lead sulphide boulders up Rosebery Creek. Twelve months later an expedition lead by Tom McDonald discovered the main lode through trenching operations, on what is now the 4 Level open cut (Easterbrook, 1962; Martin, 2002). • The Rosebery deposit was operated by several different operations until 1921 when the Electrolytic Zinc Company purchased both the Rosebery and Hercules Mines. • Drilling from surface and underground over time by current and previous owners has supported the discovery and delineation of Rosebery's mineralised lenses.
Geology	• The Rosebery volcanogenic massive sulphide (VMS) deposit is hosted within the Mt Read Volcanics, a Cambrian assemblage of lavas, volcaniclastics and sediments deposited in the Dundas Trough between the Proterozoic Rocky Cape Group and the Tyennan Block. • Sulphide mineralisation occurs in stacked stratabound massive to semi-massive base metal sulphide lenses between the Rosebery Thrust Fault and the Mt Black Thrust Fault; the host lithology and the adjoining faults all dip approximately 45 degrees east.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Drillhole information	• The Mineral Resources database consists of 6,603 diamond drillholes providing 314,170 samples. • No individual drillhole is material to the Mineral Resources estimate and hence this geological database is not supplied.
Data aggregation methods	• This is a Mineral Resources Statement and is not a report on exploration results hence no additional information is provided for this section. • No metal equivalents were used in the Mineral Resources estimation.
Relationship between mineralisation width and intercept lengths	• Mineralisation true widths are captured by interpreted mineralisation 3D wireframes. • Most drilling was at 50° to 60° angles in order to maximise true width intersections. • Geometry of mineralisation is interpreted as sub- vertical to vertical and as such current drilling allows true width of mineralisation to be determined.
Diagrams	• No individual drillhole is material to the Mineral Resources estimate and hence diagrams are not provided.
Balanced reporting	• This is a Mineral Resources Statement and is not a report on exploration results hence no additional information is provided for this section.
Other substantive exploration data	• This is a Mineral Resources Statement and is not a report on exploration results hence no additional information is provided for this section.
Further work	• Further underground near mine exploration drilling is being assessed.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Database integrity	• The following measures are in place to ensure database integrity: • All Rosebery drillhole data is stored in an SQL database on the Rosebery server, which is backed up at regular intervals. • Geological logging is entered directly into laptop computers which are uploaded to the database. Prior to 1996 DD holes were logged using Lotus spread sheets or on paper. • Assays are loaded into the database from spread sheets provided by the laboratory. • A database upgrade and full data migration was undertaken in November 2014. Several rounds of data migration checks were undertaken before allowing the database to go live. • Data validation procedures include:

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• Validation routines in the new database check for overlapping sample, lithological and alteration intervals. • Random comparisons of raw data to recorded database data are undertaken prior to reporting for 5% of the additional drillholes added in any one year. No fatal flaws have been observed from this random data review. • Bulk data is imported into buffer tables and must be validated before being uploaded to the master database.
Site visits	• The 2019 Competent Person for Mineral Resources visits site on a regular basis.
Geological interpretation	• Economic Zn-Pb-Ag-Au mineralisation occurs as massive, semi massive and disseminated base metal sulphide lenses located within the Rosebery host sequence. Economic and near-economic mineralisation is easily visually identified in drill core and underground mine development. • Drill core is routinely sampled across zones of visible sulphide mineralisation. • The method used for defining mineralisation domains for the 2019 Mineral Resources estimate is described below: • Peer reviewed exploratory data analysis was undertaken for each element of interest. • 3D wireframe models of each mineralisation style were created using an Indicator interpolation similar to kriging, using Leapfrog Geo v4.4 software. Key data inputs included composited drill data converted to Indicators and mineralisation trend information derived from traditional mapping and high quality photo images of development faces and backs. • The interpolation uses a model representing the spatial variability of each variable and this was chosen on the basis of experimental variograms derived from the data. The variograms used are characterised by low nugget and ranges in the order of 60m-80m at low grade and 25m-30m at high grade. They are strongly anisotropic. • The resultant wireframe models were visually compared to mapped or recorded mineralisation contacts from traditional geological mapping and Adamtech photo images. A close correlation between the models and points of observation is noted in most areas where data are available. • The domain models are broadly consistent with logged and mapped observations of the main lithology units present at mine scale, namely black shale, porphyry and the hanging wall and footwall contacts with the host sequence. • The Upper Mine Mineral Resources geological interpretation has been updated to use the above methodology
Dimensions	• The Rosebery mineral deposit extends from 400mE to 1800mE, 2800mN to -1100mN, 3400mRL-1800mRL (Rosebery Mine grid co-ordinates) and is currently open to the north, south and at depth. Individual lenses vary in size from a few hundred metres up to 1000m along strike and/or down-dip.

<table>
<tr><th colspan="2">Section 3 Estimating and Reporting of Mineral Resources</th></tr>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td></td><td>

- The range of minimum, maximum and average thickness of the mineralised lenses are as follows:

Minimum (m)	Maximum (m)	Mean (m)
0.2-0.3	12-36	3-6

</td></tr>
<tr><td>Estimation and modelling techniques</td><td>

- Lower mine: Grades estimation uses Ordinary Kriging (OK) as implemented in Maptek Vulcan version 11.0.4. The main inputs and parameters are described below:
- Blocks and 1m composites flagged by domain and estimated individually.
- Parent block size for estimation of 2mE x 7.5mN x 5mRL.
- Block size approximates one half of drillhole spacing in northing and RL, and is consistent with the primary sampling interval in easting (1m).
- Discretisation is 2 x 4 x 2 (X, Y, Z) for a total of 16 points per block.
- Minimum sample search number is 8 and maximum number is 24.
- Octant search methods were not used.
- A minimum of 3 drillholes is required for a block to be estimated.
- Grade capping was applied to the high grade gold domain in some lenses.
- A second estimation pass was used to estimate blocks in sparsely sampled areas not estimated in the primary estimation.
- Upper mine: historical models have used either Multiple Indicator Kriging, Ordinary Kriging or the inverse distance method, have now all been updated to match the Lower Mine methodology.
- All recoverable elements of economic interest to the Rosebery Operation (Zn, Pb, Cu, Ag, Au) and Fe have been estimated.
- No other deleterious element or non-grade variables of economic significance have been identified – hence they are not estimated.
- No dilution or recovery factors are taken into account during the estimation of Mineral Resources. These are addressed in the relevant Ore Reserves statement.
- All metals are estimated individually, and no correlation between metals is assumed or used for estimation purposes.
- Block model validation was conducted by:
- Visual inspections for true fit with the high and low grade wireframes (to check for correct placement of blocks).
- Visual comparison of block model grades against composite file grades.
- Global statistical comparison of the estimated block model grades against the declustered composite statistics and raw length-weighted data.
- Swath plots were generated and checked for all lenses. The plots confirm overall consistency between data and estimates with a reasonable degree of smoothing.

</td></tr>
</table>

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• Change of Support analysis was undertaken on all elements on a lens by lens basis.
Moisture	• Tonnes have been calculated on a dry basis, consistent with laboratory grade determinations. • No moisture calculations or assumptions are made in the modelling process.
Cut-off parameters	• Net Smelter Return (NSR) has been calculated for all block model blocks, and accounts for MMG's long-term economic assumptions (metal price, exchange rate), metal grades, metallurgical recoveries, smelter terms and conditions and off-site costs. The NSR calculation was updated in May 2019. • Rosebery Mineral Resources were reported above a $165/t NSR block grade cut-off. An example of minimum grades above $165/t NSR cut-off is as follows: 4.4% Zn, 0.95% Pb, 15 g/t Ag, 0.8 g/t Au, 0.05% Cu.
Mining factors or assumptions	• Mineral Resources block models are used as the basis for detailed mine design and scheduling and to calculate derived NPV for the life of asset (LoA). Full consideration is made of the reasonable prospect of eventual economic extraction in relation to current and future economic parameters. All important assumptions including minimum mining width and dilution are included in the mine design process. • Mined voids (stope and development drive shapes) are depleted from the final Mineral Resources estimate as at 30 June, 2019. • For Mineral Resources in the Lower Mine, in additional to removing actual mined voids, an additional 5m across strike has been removed from mined stopes as this near near-void skins and pillars as these are considered not to have reasonable prospects for mining. • For Mineral Resources in the Upper Mine, due to lack of confidence in completion in the void model, only resources away from outside edges of known stoping and development have been reported.
Metallurgical factors or assumptions	• Metallurgical processing of ore at Rosebery involves crushing and grinding followed by flotation and filtration to produce saleable concentrates of copper, lead and zinc. Additionally, gold is partly recovered as doré following recovery from a gravity concentrator. • Metallurgical recovery parameters for all payable elements are included in the NSR calculation, which is used as the cut-off grade for the Mineral Resources estimate. The metallurgical recovery function is based on recorded recoveries from the Rosebery concentrator and monitored in monthly reconciliation reports.
Environmental factors or assumptions	• Environmental factors are considered in the Rosebery life of asset work, which is updated annually and includes provision for mine closure. • Potentially acid forming (PAF) studies have been completed for sulphide-rich waste at Rosebery Mine in 2014. Determination of surface treatable and untreatable waste is currently determined by visual assessment guided by geological modelling and is not estimated or included in the 2018 Mineral Resources block models.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Bulk density	• An empirical formula is used to determine the dry bulk density (DBD), based on Pb, Zn, Cu and Fe assays and assuming a fixed partition of the Fe species between chalcopyrite and pyrite. This formula is applied to the block model estimations after interpolation has been completed. The formula applied is: DBD =2.65+0.0560 Pb%+0.0181 Zn%+0.0005 Cu%+0.0504 Fe% • A study conducted in August 1999 compared the estimated DBD against values determined using the weight in water, weight in air method and found the formula to be reliable. There has been no change to the formula in 2017-2018. • A brief review was undertaken in the reporting period comparing estimated density values (calculation applied to raw drillhole file) and the empirical formula – no material difference was identified. • The Rosebery mineralisation does not contain significant voids or porosity. The DBD measurement does not attempt to account for any porosity.
Classification	• Mineral Resources classifications used criteria that required a minimum number of three drillholes. The spatial distribution of more than one drillhole ensures that any interpolated block was informed by sufficient samples to establish grade continuity. • Drillhole spacing for classification were based on an internal Rosebery drillhole spacing study undertaken in 2017. Results from the study indicate: • Measured Mineral Resources: 15m x 15m drillhole spacing • Indicated Mineral Resources: 30m x 30m drillhole spacing • Inferred Mineral Resources are generally defined as twice the spacing of Indicated Mineral Resources provided there is reasonable geological continuity. • Zinc estimated values were used for classification. • The Mineral Resources classification reflects the Competent Persons view on the confidence and uncertainty of the Rosebery Mineral Resources.
Audits or reviews	• A review was undertaken by AMC on the 2018 Rosebery Mineral Resource. AMC considers the Rosebery Mineral Resource estimate has been completed using usual industry practises and in accordance with the requirements and guidelines of the JORC Code 2012. MMG's approach is to include geological and grade components in compiling the resource estimates which AMC considers appropriate. AMC considers that the model forms a suitable basis for Mineral Resource reporting and for use in Ore Reserves and mining studies. No material issues were identified. • The 2019 Mineral Resources estimate was peer reviewed internally with no material issues identified.
Discussion of relative accuracy/ confidence	• There is high geological confidence that the spatial location, continuity and estimated grades of the modelled lenses within the Rosebery Mineral Resources. The sheet-like, lensoidal nature of mineralisation historically exhibited is expected to be present in the remaining Mineral Resources at least at global scale.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• Minor local variations are observed at a sub-20m scale; it is recognised that the short scale variation cannot be accurately captured even at very close drill spacing, and additional mapping data is important. Short scale geometry variation appears to be related to the preferential strain around relatively competent units in the mine sequence; there is little evidence of brittle fault offsets. • Twelve month rolling reconciliation figures for the Mineral Resources model to the mill treatment reports are within 10% for all metals with the exception of copper on an annual basis, suggesting that the Rosebery Mineral Resources estimation process is sound. • Mining and development images (including traditional mapping and digital photographic images) shows good spatial correlation between modelled mineralised boundaries and actual geology. • The combination of Mineral Resources model, mapping, stope commentaries and face inspections provides reasonably accurate grade estimations for mill feed tracked on a rolling weekly basis, in each end of month report, and on a quarterly and annual basis. • Remnant mineralisation in close proximity to voids in the upper and lower levels has been removed from the reported Mineral Resources. • The accuracy and confidence of this Mineral Resources estimate is considered suitable for public reporting by the Competent Person.

6.2.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resource statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

6.2.3.1 Competent Person Statement

I, Douglas Corley, confirm that I am the Competent Person for the Rosebery Mineral Resource section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australian Institute of Geoscientists and hold Registered Professional Geoscientist (RPGeo) accreditation.
- I have reviewed the relevant Rosebery Mineral Resource section of this Report to which this Consent Statement applies.

I am a full time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Rosebery Mineral Resource section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Rosebery Mineral Resources.

6.2.3.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Rosebery Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____ Date: 22/10/2019

Douglas Corley MAIG R.P.Geo. (#1505)

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

Rex Berthelsen
Melbourne, VIC

Signature of Witness: Witness Name and Residence: (e.g. town/suburb)

6.3 Ore Reserves – Rosebery

6.3.1 Results

The 2019 Rosebery Ore Reserves are summarised in Table 20.

Table 20 2019 Rosebery Ore Reserve tonnage and grade (as at 30 June 2019)

Rosebery[1]	Tonnes (Mt)	Zinc (% Zn)	Lead (% Pb)	Copper (% Cu)	Silver (g/t Ag)	Gold (g/t Au)	**Zinc ('000 t)**	**Lead ('000 t)**	**Copper ('000 t)**	**Silver (Moz)**	**Gold (Moz)**
Proved	3.6	7.4	2.7	0.20	107	1.3	269	7	100	12.5	0.2
Probable	1.1	6.9	2.5	0.20	95	1.3	75	2	27	3.3	0.0
Total	**4.7**	**7.3**	**2.7**	**0.20**	**104**	**1.3**	**344**	**9**	**127**	**15.8**	**0.2**
Stockpile											
Proved	0.01	9.8	2.7	0.29	79	1.0	1	0.03	0.31	0.03	0.00
Total	4.7	7.3	2.7	0.20	104	1.3	**345**	**9**	**127**	**15.9**	**0.2**

[1]Cut-off grade is based on Net Smelter Return (NSR) after Royalties, expressed as a dollar value of A$165/t.
Contained metal does not imply recoverable metal.
The figures are rounded according to JORC Code guidelines and may show apparent addition errors.

6.3.2 Ore Reserves JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 21 complies with the 2012 JORC Code requirements specified by "Table-1 Section 4" of the Code.

Table 21 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Rosebery Ore Reserve 2019

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
Mineral Resources estimate for conversion to Ore Reserves	• The Mineral Resources reported inclusive of the Mineral Resources used to define the Ore Reserves. • The Mineral Resources model used the MMG March 2019 Mineral Resources model. (ros_knpwxy_gmr_1903_v3.dm) • There is high geological confidence in the spatial location, continuity and estimated grades of the modelled lenses within the Rosebery Mineral Resources. The sheet-like, lens nature of mineralisation historically exhibited is expected to be present in the remaining Mineral Resources at least at a global scale.
Site visits	• Karel Steyn is the Competent Person for the Rosebery Ore Reserves based in Melbourne Office and frequently visited the site during 2018/2019.
Study status	• The mine is an operating site with on-going detailed Life of Asset planning process.
Cut-off parameters	• The 2019 Mineral Resources and Ore Reserves have cut-off grades calculated, based on corporate guidance on metal prices and exchange rates. The site capital and operating costs, production profile, royalties and selling costs based on the 2019 Budget. Processing recoveries based on historical performance. • The breakeven cut-off grade (BCOG) and mineral Resources cut-off grade (RCOG) has been calculated using budget 2019 cost. • The operating costs, both fixed and variable, have been attributed on a per mined tonne basis using the planned mine production rate of 1.0Mtpa • The Net Smelter Return (NSR) values are based on metal prices, exchange rates, treatment charges and refinery charges (TC's & RC's), government royalties and metallurgical recoveries. • The NSR value for both BCOG and RCOG is to the mine gate and includes sustaining capital for the 2019 Ore Reserves. • Exploration drilling has been included as part of the growth capital and not as sustaining capital. • Concerning the Ore Reserves (OR) and Life of Asset (LoA), the break-even cut-off grade (BCOG) was used to evaluate the economic profitability (Level by Level). The Stope Cut-off Grade (SCOG) has been used to create stope shapes that include a planned dilution. The use of SCOG has also been utilised to determine Stopes and Development to be included in Reserves.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	(Table 1 below)

TABLE 1: UNDERGROUND CUT-OFF SUMMARY

Category of Cut-off	Bud 2019 AU$/t processed	Bud 2018 AU$/t processed	Diff AU$/t
BCOG	165	167	-2
SCOG	147	142	5
DCOG	52	60	-8
ICOG	77	105	-28
MCOG	76	96	-20
RCOG	165	167	-2
TCOG	198	197	1

Criteria	Commentary
Mining factors or assumptions	• Mining production is carried out by long-hole open stoping with a Decline Access. Stoping is conducted through both longitudinal retreat and transverse methods. • Mining lenses are divided into panels and are mined using a bottom-up sequence in a continuous 45 degree retreating either towards or away from level access drives. The nature of this mining sequence causes fluctuations in the grade profile of the short-term schedules. Each stoping panels contain between 3 and 5 sub-levels with crown pillars left in-situ between the backs of up-hole stopes and the lowest sill drive of the panel above. • Backfilling of stope voids is carried out using two methods; Cemented Rock Fill (CRF) and Rock Fill (RF). Up-hole (Crown) retreat stopes are left as an open void due to lack of access for fill placement. • Long-term stope designs are carried out using the Mineable Shape Optimiser (MSO) process within the Deswik Software package with the stope cut-off factor of AU$146/t (rounded down from 2019 SCOG), allowing for a global 1.0m hanging wall dilution within the designed shape. The length of each block used in MSO is set at 5m with each Stope is a combination of three or four of these blocks giving a stope strike length of 15m or 20m. • Stope strike lengths of 15m were used in W and X Lens while the other lenses used 20m. The height set to 20-25m (floor to floor) and the minimum mining width of 4.5m. The horizontal width has been adjusted to 4.65m to allow for the low dip of the ore body and to achieve the 4.5 m true widths. • A Mining Recovery factor of 70%-90%, depending on the area, is applied to mined ore tonnes based on historic reconciliations. • Access to the orebody is through a decline 5.5 mH x 5.5 mW at a 1:7 gradient. The approximate standoff distance between orebody and stoping footwall and major infrastructure; stockpiles, vent rises, escape-ways, declines and ancillary development is 65-70m. • For Ore Reserve Reporting, no Inferred material is included in the mine design inventory. • Production of ore is in Measured and Indicated Mineral Resources only with grade control drilling programs scheduled to convert Indicated Mineral Resources before development or stoping activities. All mine development is strictly under Survey control. Geological development control is currently not implemented at Rosebery.

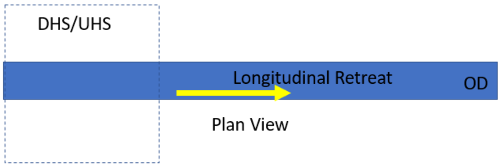
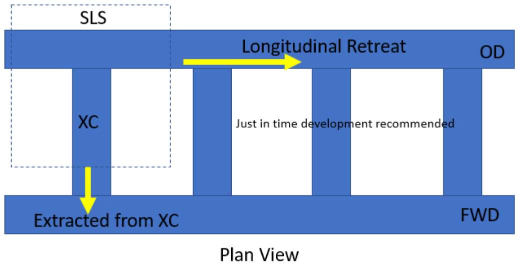
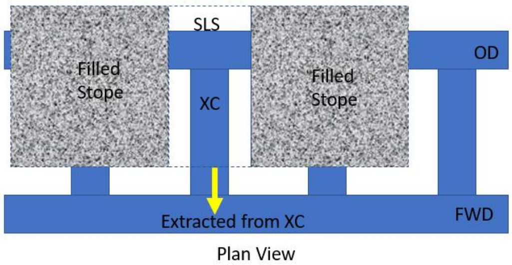
Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	However, geology does play a role should the minerals carrying the ore decrease below DCOG and/or disappears in the advancing face. • The current primary ventilation system supplies approximately 650 m^3/s (Measured at depth) of air to the underground mine, which is designed to allow extraction from the multiple ore lenses.
Geotechnical	• Rosebery is one of the deepest mines in Australia with challenging ground conditions that result in the closure (squeezing) of development drives close to stoping areas and mining-induced seismicity. • The anisotropic nature of the rock mass sees higher capacity support requirements and increased rehabilitation costs for drives that strike North-South compared to drives that strike East-West. • Just in time development, preferential drive orientations and high displacement capacity support combined with multiple stages of rehabilitation are used to maintain serviceability of development. • Seismic monitoring, seismic re-entry exclusion periods and seismic TARPS following stope firings are used to control risk to personnel from seismic hazards. • High displacement ground support (Dynamic Support) is selected in locations where increased seismic risk has been determined by the geotechnical department during the POI process. Where a significant seismic event has occurred (>0.6ML) a review of ground support capacity and requirements is completed. • Equivalent Linear Overbreak Slough (ELOS) is the measure used to provide guidance on Overbreak recommendations. At Rosebery, ELOS is a linear measure of overbreak from the designed hanging wall stope surface. • It has been determined at Rosebery Mine that the Hydraulic Radius (HR) of a stope is proportional to ELOS. Average ELOS parameters for stope HR can be seen in the table below:

HR (m)	No. of stopes	Average reconciled ELOS (m)	Recommended Scheduling ELOS (m)
<4	23	0.4	0.5
4 to 5	73	0.7	0.8
5 to 6	72	0.8	1.0
>6	30	1.3	1.5

- Dilution estimates are reconciled on completion of stoping and ELOS guidance adjusted where required. Based on the average reconciled ELOS in the different panels/stoping areas of the mine, dilution estimate is provided for the ore reserve.
- Rosebery mine utilises three main extraction methods based on depth, stress and presence of mined voids. The table below can be utilised to select the method of mining best suited for expected conditions.

Section 4 Estimation and Reporting of Ore Reserves

Criteria	Commentary
	(continued – see method table and bullet below)

Method	Stress State	Diagram
Benching - longitudinal retreat along a single OD	Low Stress, low yielding rock mass, reduced seismic risk	
Transverse Slashing – longitudinal retreat, extracted from cross cuts with no personnel and equipment access into OD deemed to be of high seismic risk, slashed from FWD. development to be just in time where possible	High Stress, high yielding rock mass, increased seismic risk	
Pillar recovery – a transverse retreat from xc, slashed from the FWD. Extraction of intermediate pillars, assessment of fill material and open voids required before extraction	Irrelevant, stress and seismic risk do not dictate mining method, presence of previously mined stopes adjacent to remnant pillar/ stope.	

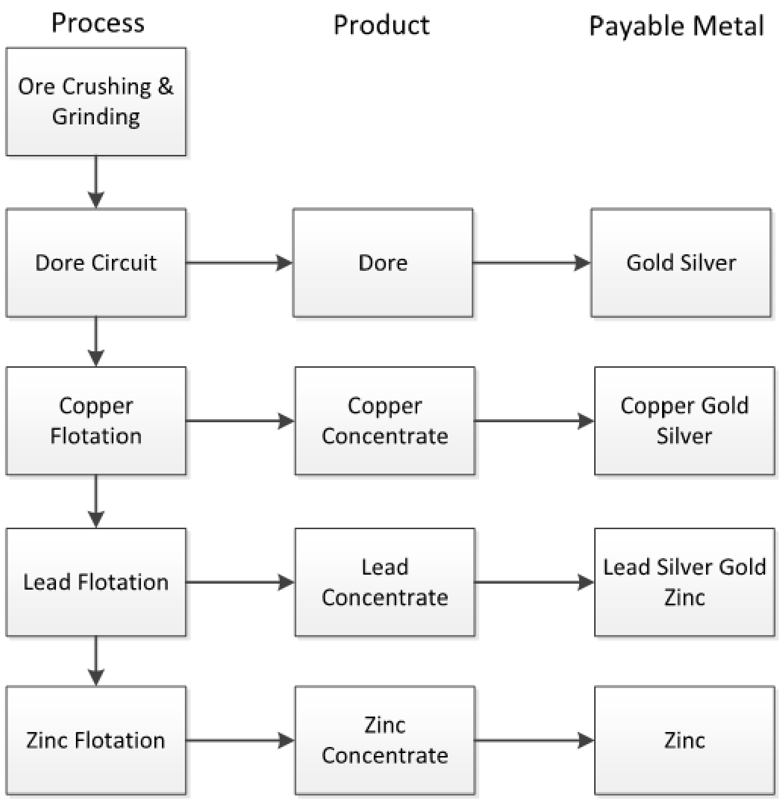
- Numerical modelling using both linear elastic and non-linear elastic is conducted by MMG personnel and Consultants to assess the overall mine sequence to minimise potential seismicity and drive closure.

Criteria	Commentary
Metallurgical factors or assumptions	• Rosebery is a polymetallic underground mine with all ore processed through an on-site mill and concentrator. Underground ore production is sourced from multiple ore lenses. • The table below outlines the critical production physicals for 2019. These are based on actual data to June 2019 and forecast for the remainder of the year. The processing plant has a nameplate capacity of 1.0 Mtpa. • The site is currently mine constrained, and mining and processing physicals are the same rates. Minimal stockpiles are maintained for the mill.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

Tonnes (t)	Zinc (%)	Lead (%)	Copper (%)	Gold (g/t)	Silver (g/t)	Fe (%)
1,030,482	10.3	3.2	0.2	1.1	98.3	9.3

- From the mill, there are four saleable products generated:
  - Doré
  - Copper Concentrate
  - Zinc Concentrate
  - Lead Concentrate
- The flow chart below outlines the block flowsheet, products and payable metals.



- Based on the grades for 2019 (table above), the subsequent recoveries calculated from the regression analysis. These have been determined by inputting the grades into the NSR calculator spreadsheet to identify the relevant recoveries. These summarised in the below table.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

Product	Copper (%)	Zinc (%)	Lead (%)	Silver (%)	Gold (%)
Zinc Concentrate		**87%**			
Lead Concentrate		**6%**	**79%**	**42%**	**16%**
Copper Concentrate	**59%**			**38%**	**36%**
Gold Dore				**0.2%**	**26%**

Criteria	Commentary
Environmental	• The 2/5 Tailings storage facility Dam was commissioned in April 2018. Commissioning included a new pump station, tailings pipeline and seepage collection ponds • Wastewater - The wastewater management at Rosebery involves collecting all potentially contaminated water, including stormwater, mine water and mill tailings at the Effluent Treatment Plant (ETP), where lime is added prior to pumping the whole volume of treated water to the Bobadil TSF via the Flume (an open concrete channel flowing under gravity to the TSF). After the final polishing stage, water is subsequently discharged to Lake Pieman. • The ETP hydraulic capacity is approximately 600 l/sec, and the plant is capable of receiving 335 l/sec of site mine water with remaining limited spare capacity of approximately 265 l/sec to treat the site surface rain or stormwater. • Environmental legacy sites - There is a range of environmental legacy sites that are indirectly related to Rosebery that are being managed by MMG. • The historic Hercules area has an impact on the land area, along with water quality issues. This area is the most significant "legacy site".. Smaller historic legacy sites exist, numbering at least ten known sites. • Waste rock - Waste rock is characterised as either NAF, PAF or High PAF. To-date the majority of waste rock produced has been retained underground and used for stope filling, either as RF or CRF. Previously, a surplus waste rock was trucked to the surface and unloaded at the waste rock dump and was treated by adding a layer of lime on top and below every layer of waste rock. Recent Life of Asset (LoA) planning suggests there will be no requirement for waste rock to be trucked to surface.
Infrastructure	• MMG Limited holds title to the Rosebery Mine Lease (ML 28M/1993 – 4,906ha) which covers an area that includes the Rosebery, Hercules and South Hercules base and precious metal mines. • Electric power to the site feeds in through No. 1 Substation located adjacent to the Mill Car Park on Arthur Street. There is a contract for the supply to the site with the Electrical Supply Authority for the region. The Commerce Department manages this, and all responsibilities (such as notification, to change in supply by either party) are detailed in this contract. The Electrical Supply Authority's substation currently has an N+1 arrangement which ensures that supply is maintained in the event of a loss of critical equipment (e.g. Transformer). This also provides the Electrical Supply Authority with the ability to manage a potential increase in supply requirement by the site. Further, works are currently underway to provide an upgrade to the substation infrastructure, the result of which will provide a significant increase in the security of the supply to the site.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**

	• Freshwater for the site is currently sourced from Lake Pieman, with allotments of 5,500 ML and 1,647 ML respectively. This will leave Lake Pieman as the sole source of freshwater.
	• In total, the Rosebery Mine operation employs 324 MMG people and a further 145 contractors, covering all aspects of the operation. Within the mining area, there are 203 MMG employees.
	• Primary communication from the Rosebery Mine site is by phone along with surface mobile phone coverage, provided by Telstra. Phones are available throughout the main office building along with the mill and other surface buildings. There is also an extension of the phone system underground. Along with the phone system, there is also email and internet services associated with the lines. This is available through the office area through a wireless system. The wireless system is also extended throughout part of the underground to assist with the seismic system.
	• The main system for communication underground is through radio via a leaky feeder and fibre system. The radio system operates on multiple channels with general, extended discussion and emergency channels.
	• With mining activity taking place underground at Rosebery, access to the operating areas is by the main decline, "The Fletcher Decline".
	• While there are multiple paths from certain points underground, only one main route is used to access the upper mid area of K Lens. From this point, access splits between two declines to the K/N/P Lens area and the W/X/Y Lenses. Other declines are used to direct primary airflow. The ore is hauled out of the mine in a fleet of 55-60 tonne haul trucks.
	• The Rosebery primary ventilation circuit is essentially a series circuit where airflow accumulates airborne contaminants and heat as it progresses deeper into the mine, at the 46K Level fresh air is introduced into the circuit via the NDC shaft diluting contaminated air, and finally reporting to the return airways and exhausting to surface. The current primary ventilation system supplies approximately 650 m^3/s of air usefully used throughout the mine. The system comprises of three primary fan installations on the surface (PSF1, PSF2 and PSF3) and two booster fan installations underground (19B Booster Fans and 33P Booster Fan). The specifications of these fan installations are detailed below:
	  ○ PSF1 (New NUC)) are 2 x 1800 kW Howden centrifugal fans. Design Duty is 400 m^3/s.
	  ○ PSF 2 (Old NUC) is a single 550kW centrifugal fan. The duty is 100 m^3/s.
	  ○ PSF 3 (SUC) is 2 x 550 kW Korfmann KGL 2600 mm axial fans in parallel. The duty is 161 m^3/s.
	  ○ The 33P Booster fan is a Flaktwoods 550kW 2600 VP axial fan.
	  ○ 19B Booster fan is a single Twin 90kW ACC1400 MK4 secondary fan. A fan upgrade is being considered due it being under-designed from the original installation (two Twin 110kW ACC1400 MK4 fans).
	• The main intake airways of the mine are the decline portal, No.2 Shaft and the NDC shaft. However, there is also minimal leakage through historic workings.
	• There are a crib room and workshop facility at the 46K Level to offer these facilities closer to the current and ongoing working areas.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• The concentrate is transported from site using Tasrail, which is the only railway line service that connects the West Coast area to the port in Burnie. • Tailings from the ore treatment were placed in a Tailings Storage Facility (TSF) located to the north of Rosebery at Bobadil until April 2018. Tailings have subsequently been discharged to the new 2/5 TSF to the south-west of the Rosebery township.
Costs	• Costs used in determining the cut-off values used for the Ore Reserves estimation were based on the 2019 Budget. Cost"s were inclusive of Operating and Sustaining Capital. • Costs are in Australian dollars and are converted to US dollars at the applicable exchange rate. • MMG Group Finance supplies the commodity price and exchange rate assumptions. These price assumptions are then applied to the period in which the ore is scheduled to be produced to determine the extracted NSR. • All applicable inflation rates, exchange rates, transportation charges, smelting & refining costs, penalties for failure to meet specification and royalties are included as part of the NSR calculations evaluated against the annually released geology block model to estimate projected value. • Penalties deducting from revenue may be applied where concentrates contain a higher percentage of unwanted minerals. • A cash flow model was produced based on the detailed mine schedule and the aforementioned costs to determine the NPV. • The Ore Reserves estimation has been based on these costs.
Revenue factors	• Commodity prices and the exchange rate assumptions are the same as reported in the cut-off parameters section. These are provided by MMG Group Finance, approved by the MMG Board, and are based on external company broker consensus and internal MMG analysis. • Treatment and refining charges, royalties and transportation costs for different commodities were supplied by MMG Group Finance and have been included in the NSR calculation. • The formulas, regression values and assumptions used in the NSR calculation are based on the historical data provided by the Rosebery Metallurgy Department. • Economic evaluations are carried out to verify that mining areas are profitable. The cost assumptions were applied to the mining physicals, and the revenue was calculated by multiplying the recovered ore tonnes by the appropriate NSR value. The profitable and marginal stopes were included in the Ore Reserves.
Market assessment	• Although the rate of growth of global zinc consumption is slowing, demand is still expected to increase modestly over the medium term, with growth mainly coming from China the world's developing nations. • Stocks of refined zinc are currently at historically low levels after several years of market deficits due to limited mine production and concentrate availability.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• Zinc mine production has now recovered but, there is uncertainty surrounding future new supply, while there is also limited growth in new smelting capacity. Increasingly stringent environmental regulations in China also restrict supply growth in that region. • New projects tend to be more economically challenging than existing or recently closed operations due to a range of factors including grade, size and location. • The combination of current low stocks, modest demand growth prospects and limitations on future supply should be supportive of the zinc price over the medium term. • Rosebery has a life of mine agreements in place with Nyrstar covering 100% of zinc and lead concentrate production, which is sold to them on international terms. There is also good demand for Rosebery's small production of copper concentrates which is exported under long term contract.
Economic	• Rosebery is an established operating mine. Costs used in the NPV calculation are based on historical data. Revenues are calculated based on historical and contracted realisation costs and realistic long-term metal prices. • The mine is profitable, and life-of-asset economic modelling shows that the Ore Reserves are economic. The Life of Asset (LOA) financial model demonstrates the mine has a positive NPV. MMG uses a discount rate appropriate to the size and nature of the organisation and deposit
Social	• The West Coast area of Tasmania has a robust and long history with mining. There are a large number of people employed by the mine from the town of Rosebery and the local government area. • Community issues and feedback associated with the Rosebery mine are generally received through the MMG Community Liaison Office ..All issues are reported on a Communication and Complaints to form and forwarded to the Administration and Community Assistant for action, per the Site Complaints Procedure. The Administration and Community Assistant makes direct contact with the complainant to discuss the issue and once details are understood, communicates with the department concerned to resolve the matter through to resolution. • During the 2017/2018 reporting period, a total of three community complaints were received: one linked to noise from blasting; one relating to dust; and the third linked to water discharge. All claims were investigated and resolved in consultation with the complainant. 2018/2019 reporting period a total of 12 community complaints were received: one linked to noise from the crusher alarm; one relating to train idling; 9 issues relating to dust from Bobadil Tailings dam; the other complaint related to pollution of Rosebery Creek. All claims were investigated and resolved in consultation with the complainants. • A key social condition linked to the TSF was the development of a community walking track and recreation area. Rosebery is on track to meet this condition in early 2019, with construction of the track and is nearing completion. This is 95% complete – this work was not able to be part of the project due to budget and was undertaken using funds from the scrap metal community fund. • In 2019, Rosebery will also undertake a range of social performance activities, including updating the Rosebery social baseline study; Social Impact and Opportunities Assessment; and development of a management plan to support future

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	social performance and impact management activities. The final report is currently being drafted and SIMP is being developed.
Tailings	• Construction of Stage 1 of the 2/5 TSF completed in April 2018. The table below outlines the expected tails storage capacities at the start of 2019 for Bobadil, and the completion of the stage lifts for Dam 2/5. **Location** / **Tailings Capacity (**Tonnes) / **Comment** Bobadil / 1,040,000 / Forecast 2020 completion Dam 2/5 – Stage / 2,250,000 / Completed and in use Dam 2/5 – Stage / 2,000,000 / Forecast 2022 completion • The status of approvals and communication with the government provided in the table below. All projects have been approved promptly with close communication maintained by the Environmental Protection Agency (EPA). • The table below details the current surface waste stockpiles, and lists those that could be used for backfill activities before closure. Some waste rock dumps are located under existing infrastructure, which adds cost if they are to be recovered. **Location** / **Closure Estimate** (Tonnes) / **Assume Available*** (Tonnes) WRD Assay Creek / 330,000 / 330,000 WRD Overflow Car- / 220,000 / - WRD behind 7L / 570,000 / 570,000 WRD next to crusher / 540,000 / - WRD along William / 60,000 / 60,000 WRD next to Geo / 130,000 / 130,000 WRD next to Services / 60,000 / - 4L Waste / 500,000 / 500,000 **TOTAL** / **2,410,000** / **1,590,000** • *Assumes available for backfill activities before closure, WRD location not impacting the required infrastructure*
Classification	• Ore Reserves classification follows the Mineral Resources classification where Proved Ore Reserves are only derived from Measured Mineral Resource, and Probable Ore Reserves are only derived from Indicated Mineral Resources. No Inferred Mineral Resources have been included in the Ore Reserves. • The Competent Person deems this approach is aligned with the JORC Code and is appropriate for the classification of the Rosebery Ore Reserves. • Where stopes contain more than one Mineral Resources category, then the individual classification components have been treated and reported as outlined above.
Audit or Reviews	• The Processing and Mineral Resources competent person at Rosebery reviewed the NSR script to ensure correct operation for each model. Detail has been added to the script and a background document to track when and who has made changes. • Mineral Resources block models were validated during the design and evaluation process.

Section 4 Estimation and Reporting of Ore Reserves	
Criteria	**Commentary**
	• There has been an external audit carried out on the Ore Reserves process during 2018 for the 2017 Ore Reserve estimation. (AMC Consultants 20 July 2018). Below overall comment from AMC; Overall, AMC considers the methodology used to generate the 2017 Reserves follows good industry practise.
Discussion of relative accuracy/confidence	• The key risks that could materially change or affect the Ore Reserves estimate for Rosebery include: o Seismicity: The Rosebery mine has had several significant seismic events in the past. Potential exists for future seismic events to occur that may potentially impact on the overall recovery of the Ore Reserves. o Induced stress: the depth of mining at Rosebery leads to drive closure and difficult mining conditions. This may impact the ability of Rosebery to extract the ore reserves contained within sill pillars. o Drop-in Zinc grade, NSR below TCOG and metal price. o Ventilation/Heat: as Rosebery continues to mine at depth and in multiple areas, primary ventilation needs to be shared adequately and heat management practices enforced. This may impact the extraction and haulage of ore and advancement of development. • Resource Delineation & Reserve Definition drilling is applied to define tonnage and grade before mining locally. Ore Reserves based on all available relevant information. o The Proved Ore Reserves is based on a local scale and is suitable as a local estimate. o The Probable Ore Reserves based on local and global scale information. • Ore Reserves accuracy and confidence that may have a material change in modifying factors are as discussed throughout this table. • The Ore Reserve is based on the results of the operating mine. There is confidence in the estimate compared with actual production data.

6.3.3 Expert Input Table

A number of persons have contributed key inputs to the Ore Reserves determination. These are listed below in Table 22.

In compiling the Ore Reserves, the Competent Person has reviewed the supplied information for reasonableness but has relied on this advice and information to be correct.

Table 22 Contributing Experts – Rosebery Ore Reserves

EXPERT PERSON / COMPANY	AREA OF EXPERTISE
Douglas Corley, Manager Geology AAA, MMG Ltd (Melbourne)	Geological Mineral Resource Model
Blake Ericksen, Senior Business Analysis, MMG Ltd (Melbourne)	Economic Assumptions, Marketing, Sea Freight and TC/RC
Will Downie, Senior Metallurgist, MMG Ltd (Rosebery)	Metallurgy
Claire Beresford, Senior Business Analyst, MMG Ltd (Melbourne)	Mining capital and Operating Costs
Ben Small, Senior Geotechnical Engineer, MMG Ltd (Rosebery)	Geotechnical
Dean Wall, Senior Long-term Planning Engineer, MMG Ltd (Rosebery)	Mining Parameters, Cut-off estimation, Mine Design and Scheduling
Jonathon Eden, SHEC Delivery MMG Ltd (Rosebery)	Environmental
Jonathan Crosbie, Group Manager - Closure & Remediation MMG Ltd (Melbourne)	Mine Closure

6.3.4 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Ore Reserve statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

6.3.4.1 Competent Person Statement

I, Karel Steyn, confirm that I am the Competent Person for the Rosebery Ore Reserve section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australasian Institute of Mining and Metallurgy
- I have reviewed the relevant Rosebery Ore Reserve section of this Report, to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Rosebery Ore Reserve section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Rosebery Ore Reserve.

6.3.4.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Rosebery Ore Reserves - I consent to the release of the 2019 Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

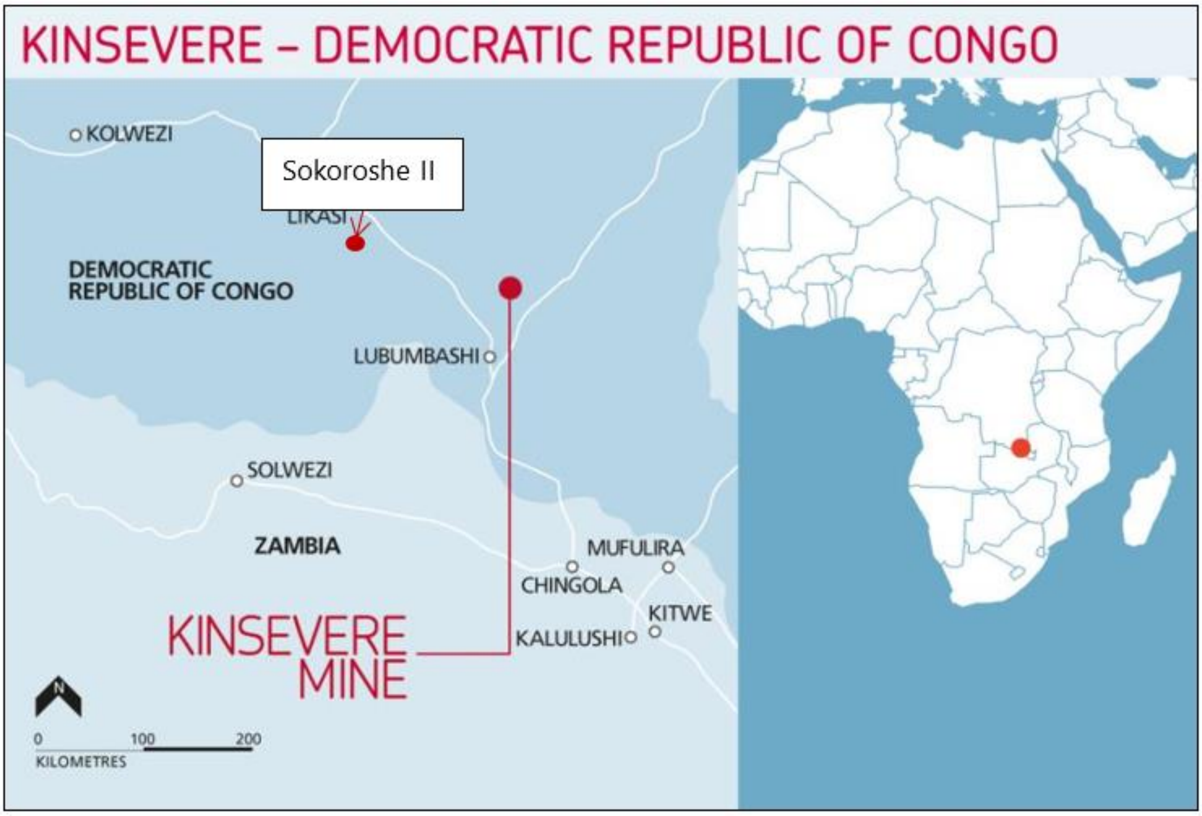
This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	22/10/2019
Karel Steyn MAusIMM (#309192)	Date:
This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.	Rex Berthelsen Melbourne, VIC
Signature of Witness:	Witness Name and Residence: (e.g. town/suburb)

7 SOKOROSHE II

7.1 Introduction and Setting

The Sokoroshe II Project is located on the license PE538 in Democratic Republic of Congo, DRC. The PE538 tenement belongs to the DRC state owned mining company GECAMINES and is part of a package of 8 tenements granted to MMG under an amodiation agreement which became effective on 13 May 2014. The project is situated in the South East part of the Congolese Copperbelt (CCB), located approximately 43Km northwest of Lubumbashi and is approximately 25Km west of the Kinsevere mine as the crow flies (See Figure 7-1).

Figure 7-1 Sokoroshe II project location



There is currently no mining occurring at the Sokoroshe II mineral deposit, but it was illegally mined from 2010 to 2013 by a small-scale mining cooperative.

7.2 Mineral Resources – Sokoroshe II

7.2.1 Results

The 2019 Sokoroshe II Mineral Resources are summarised in Table 23. There are no Ore Reserves for Sokoroshe II.

Table 23 2019 Sokoroshe II Mineral Resources tonnage and grade (as at 30 June 2019)

Sokoroshe II Mineral Resource

					Contained Metal		
Sokoroshe Oxide Copper[2]	**Tonnes (Mt)**	**Copper (% Cu)**	**Copper (% CuAS[1])**	**Cobalt (% Co)**	**Copper ('000)**	**Copper AS[1] ('000)**	**Cobalt ('000)**
Measured							
Indicated	0.8	3.5	2.9	0.3	28	24	2.3
Inferred	0.1	1.9	1.5	0.1	2.1	1.6	0.1
Total	**0.9**	**3.3**	**2.7**	**0.3**	**30**	**25**	**2.4**

[1] AS stands for Acid Soluble

[2] 1.1% Acid soluble Cu cut-off grade

All Mineral Resources except stockpiles are contained within a US$3.64/lb Cu pit shell

Contained metal does not imply recoverable metal.

Figures are rounded according to JORC Code guidelines and may show apparent addition errors.

7.2.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 24 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 24 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Nambulwa/DZ Mineral Resources 2019

Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Sampling techniques	• The Mineral Resources uses a combination of reverse circulation (RC) and drilling diamond drilling (DD). • DD core is sampled mostly as 1m intervals within mineralised rock while samples in un-mineralised zones are sampled over 4m lengths. Sampling is predominantly performed by cutting half core, with half retained for future reference. • Reverse circulation (RC) is composited into 1m samples within mineralised rock and 2, 3 and 4 composites in unmineralised rock. Samples are collected after riffle splitting. • Each sample is crushed and pulverised to produce a pulp (>80% passing 75µm) prior to laboratory analysis. • Measures taken to ensure sample representivity include orientation of the drill holes as close as practical to perpendicular to the known mineralised structure. • The sample types, nature, quality and sample preparation techniques are considered appropriate for the style of the Sokoroshe II mineralisation by the Competent Person.
Drilling techniques	• Reverse Circulation drilling (62 holes for 7,079 metres) • Diamond drilling of PQ and HQ diameter (10 holes for 1,539.6m)

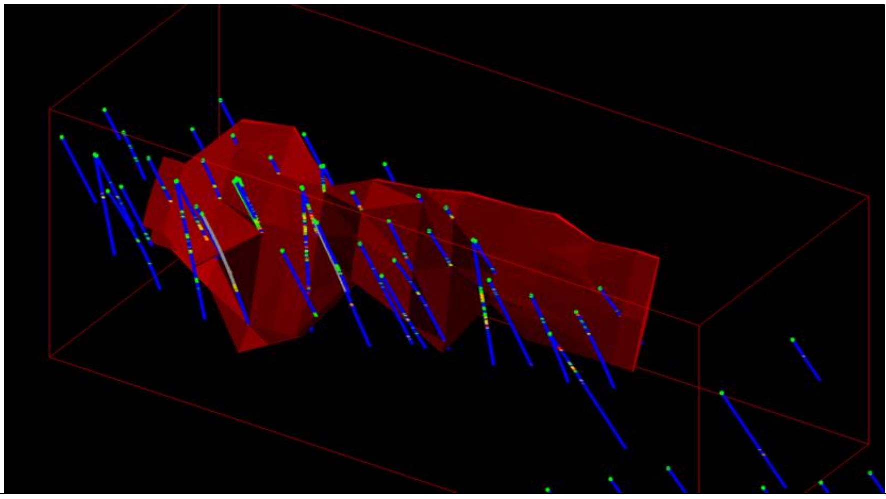
Drill sample recovery	• DD core recovery was measured using tape measure, measuring actual core recovered between the core block versus drilled interval. Measured accuracy was down to 1cm.
	• RC chip recovery was measured by weighing each 1m sample bag immediately following collection from the cyclone.
	• Sample recovery during diamond drilling was maximised using the following methods:
	  o Short drill runs (~30cm)
	  o Using drilling additives, muds and chemicals to improve broken ground conditions.
	  o Using the triple tube methodology in the core barrel.
	  o Reducing water pressure to prevent washout of friable material
	• Sample recovery during RC drilling was maximized using the following methods:
	  o Adjusting air pressures to the prevailing ground condition.
	  o Using new hammer bits and replacing when showing signs of wear.
	• No relationship between sample recovery and grade was demonstrated in diamond drilling drill results.

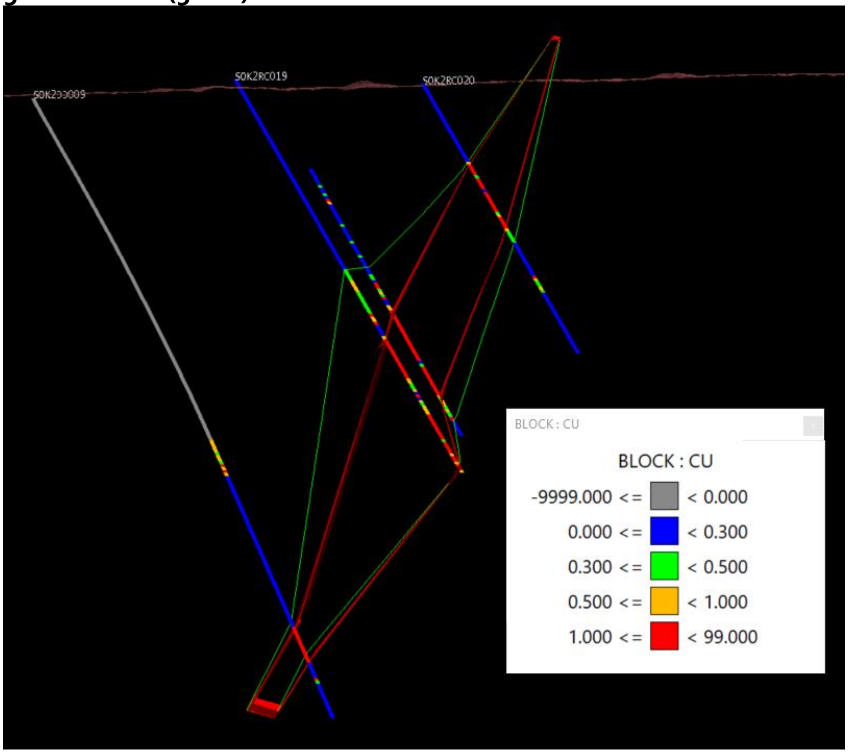
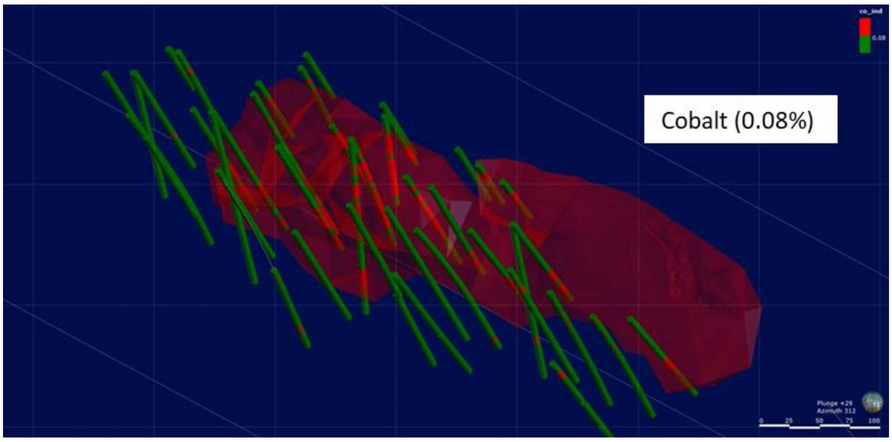
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Logging	• DD core and RC chips have been geologically logged and entered into the MMG database (Geobank). The level of detail supports the estimation of Mineral Resources. Additional geotechnical logging is required for further studies of the Sokoroshe II deposit. • Logging combines both qualitative and quantitative measurements. • Core has been photographed (wet and dry). • 100% of core has been logged.
Sub-sampling techniques and sample preparation	• DD core was sampled as half core by splitting the core longitudinally using a diamond saw. • RC chips were split and sampled using a cyclone and riffle splitter. • The drill core and drill chip samples are received, recorded on the sample sheet, weighed, and dried at average temperature of 105 ◦C for 8 hours (or more) depending on wetness at the sample preparation laboratory. • The drill core and drill chip samples are crushed and homogenised in a jaw crusher to 70% passing 2mm. The jaw crusher is cleaned after every crushed sample. • The sample size is reduced to 1000 grams in a riffle splitter to be pulverised • in an LM2 machine to 85% passing 75 µm. QC grind checks using wet sieving at 75 µm on 1 in 10 samples. • The pulverising bowl is cleaned after every sample. • The sample size for both diamond and RC samples is considered appropriate to the grain size of the material being sampled.
Quality of assay data and laboratory tests	• ALS Chemex Laboratory follows the preparation protocol PREP-31B for drill core and drill chip samples. • ALS Chemex Laboratory provides 48 Multi-Elements geochemical by HF-HNO3-HClO4 acid digestion, HCl leach followed by ICP-AES and ICP-MS analysis. Four Acid digest is considered a total digestion. • No geophysical tools, spectrometers (apart from those used in the assay laboratory) or handheld XRF instruments have been used for the estimation of the Sokoroshe II Mineral Resource. • Standards (certified reference materials) and duplicates were inserted at a rate of 1/20 and coarse blanks at a rate of 1/40 for all analyses. Umpires were selected and analysed at Intertek Genalysis using similar methods as ALS Minerals. Results indicate that assay analysis has been undertaken at an acceptable level of accuracy and precision. • No significant QA/QC issues have been found. Standards deliver less than 2% relative bias. Some blanks indicate very low-level contamination up to 47ppm Cu, which is insignificant to the Mineral Resource estimate. Duplicate results show very good correlation against original results.

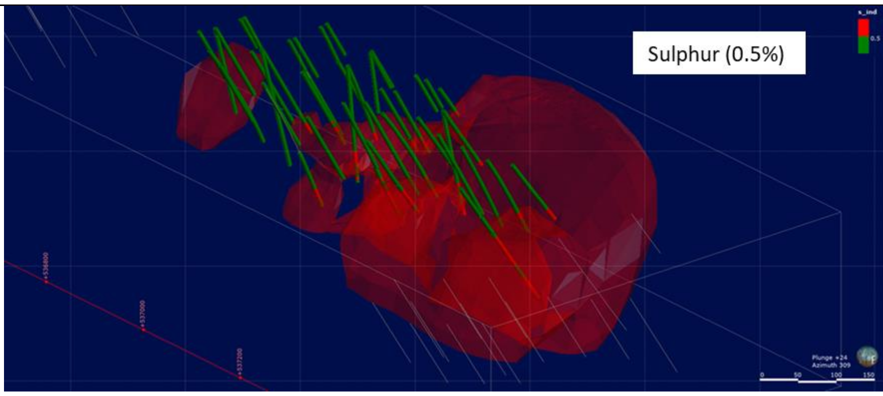
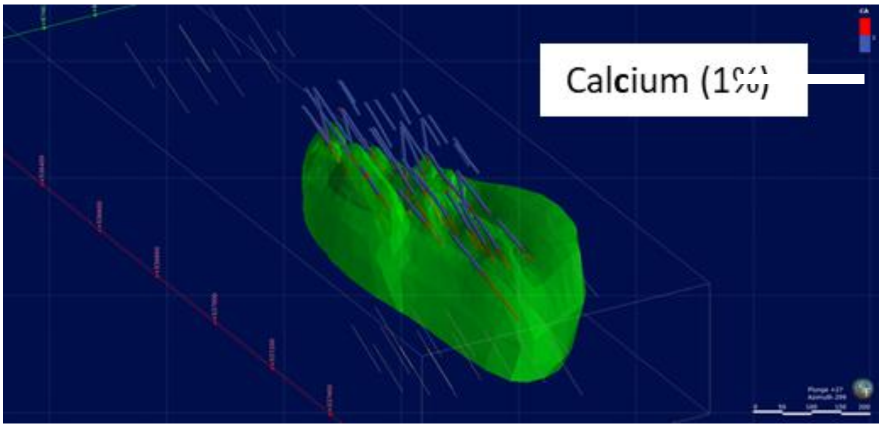
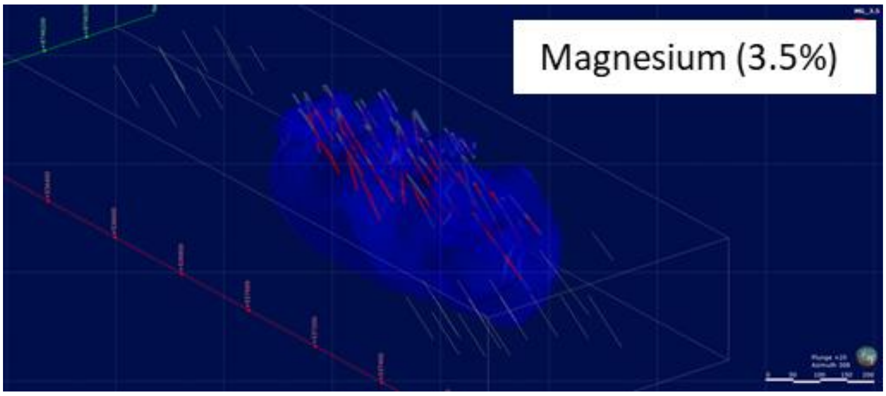
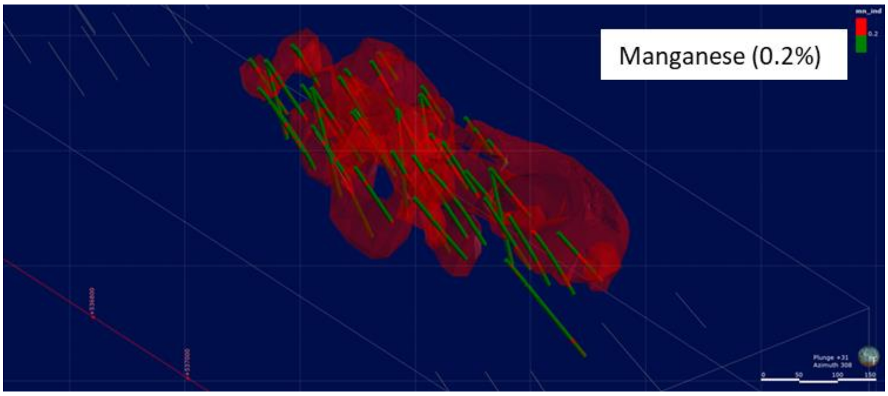
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
Verification of sampling and assaying	• Significant intercepts have been verified by comparison against the geological log, which has been checked by several personnel. • Twin holes have been drilled on section 536860mE with comparable results being returned for three closely spaced drill holes. • Primary data is stored in a Geobank database, which is maintained according to MMG database protocols. Data is logged, entered and verified in the process of data management. Database is stored on MMG server and routinely backed up. • No adjustment has been made to assay data.
Location of data points	• Collar positions for both diamond drilling and RC drilling were located using handheld GPS devices to ±3m accuracy. • Collar positions were subsequently located by the contractor company Alpha Topo RDC using DGPS. • The REFLEX EZ instrument was used for downhole surveys for diamond drilling. RC drilling downhole surveys were not carried out. Azimuth and dip were extrapolated from measurements taken from the surface using compass and clinometer. • Sokoroshe II uses the projected coordinate system: WGS84 Universal Transverse Mercator (UTM), ellipsoid 35 south. • The surface Digital Terrain Model (DTM) was generated from the Airborne Geophysics XCalibur surveys carried out in 2015. The dataset was found to be adequate with topographic control to ±3m accuracy. • A Lidar survey undertaken by AlphaTopo was carried out subsequently and was used to correct the existing pit surface.
Data spacing and distribution	• Drill hole data are spaced on approximately 40m (N-S oriented) drill sections with holes on section spaced 50 to 70m. • Data spacing is enough to estimate a global Mineral Resource but considered too wide to support local estimates of tonnes and grades. • Additional drilling requires to satisfy local estimate of tonne and grades to a Measured classification. • No additional sample compositing has been applied apart from sample length selection.
Orientation of data in relation to geological structure	• The orientation of sampling is across the mineral deposit and is considered to represent unbiased sampling of the deposit. However, alternate drilling orientations have not been undertaken to confirm this. • No sampling bias is thought to have been introduced due to the relationship of drilling orientation to key mineralised structures.
Sample security	• The collected drill core and chip samples are packed in a labelled plastic bag along with a labelled plastic ID tag. • The plastic bag is tied with a cable ties to secure the sample and to prevent contamination.

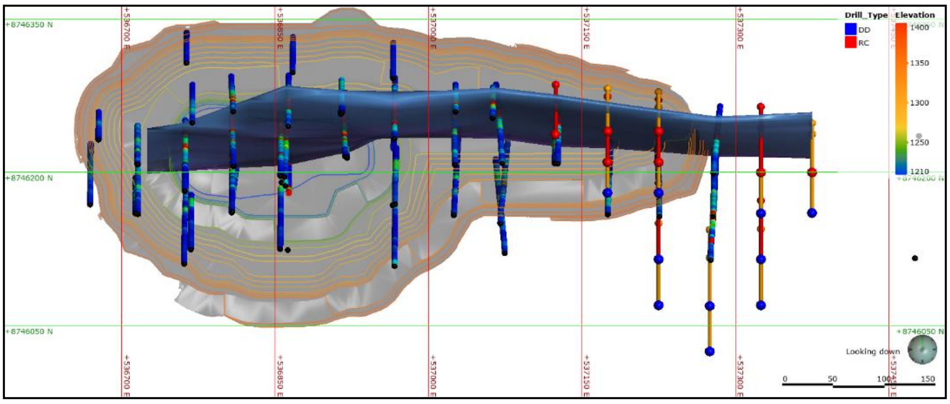
Section 1 Sampling Techniques and Data	
Criteria	**Commentary**
	• A set of 15 plastic sample bags are packed into labelled poly-weave bags, ready to be shipped from the field to the sample preparation laboratory. • Field packing documents and sample sheets are prepared and sent together with the poly-weave bags to the sample preparation laboratory. • After sample preparation, envelopes of 100-200g of pulp for each sample are inserted into labelled boxes of ~40 envelopes each, labelled with dispatch ID and laboratory destination to be sent to ALS Chemex in Johannesburg. • Two sets of duplicate pulps of 100-200g are inserted into labelled boxes of ~40 envelopes each to be stored on site in storage containers. • The shipment of pulps is done by the Kinsevere Store department via Fedex or DHL using waybill number for tracking. • The on-site sample preparation laboratory is using the ALS-Chemex LIM System, generating a unique barcode for each batch and load in the preparation chain.
Audit and reviews	• No external audits or reviews of sampling techniques and data have been conducted for the Sokoroshe II mineral deposit. • Data has been reviewed by the Competent Person as part of this Mineral Resource estimate. No significant issues were identified. Minor items included unusually high calcium values in one drill hole requires confirmation.

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Mineral tenement and land tenure status	• The Sokoroshe II project consists of one mining tenement or Permis d'Exploitation, PE538, with an area of 6 cadastral units (about 5.1 Km2). The mineral rights of PE538 are held by La Générale des Carrierés et des Mines (Gécamines), the DRC state-owned mining company. MMG rights to the tenement are granted under the terms of the Mutoshi Swap Framework Agreement. • MMG declared an Inferred Mineral Resource on 17 March 2017 to retain the lease holding and transition it from a status of Exploration Period to Development Period under the terms of the agreement. According to the agreement, the "Development Period" shall start on the date on which the first Development Work Program has been agreed between Gecamines and MMG Kinsevere (the Development Period start date). The Development Period shall have a duration of 5 calendar years (1825 days) from the Development Period start date. MMG Kinsevere must establish Proved Reserves to achieve a viable economic exploitation of the deposits contained in the retained permits viz. PE538 Sokoroshe 2. MMG Kinsevere submitted its first Development Work Program to Gecamines for approval on 4 July 2017. Pursuant to clause 6.2.4(i), Gecamines was provided with 30 days to express its comments or disagreement on the first Development Work Program, which will then be deemed accepted in the absence of receipt of comments or disagreement of Gecamines within this period. MMG Kinsevere did not receive any comments or disagreement from Gecamines within the 30-day period (or any following period). Accordingly, the first Development Work Program was deemed accepted by Gecamines as from 4 August 2017 and the

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	Development Period Start Date was also 4 August 2017. Contained copper within the lease has an upper limit of 1.8 Mt. The Sokoroshe II Inferred Mineral Resource was within this limit.
Exploration done by other parties	• Soil sampling on 120x120m grid and geology mapping were done in 1976 by Gecamines. No data available for this work. • Ruashi Holdings/Metorex carried out unknown exploration work in 2005 at Sokoroshe II. No data available for this work.
Geology	• Sediment-hosted style copper deposit, hosted in the lower part of the Neoproterozoic Katanga Supergroup in the Roan stratigraphic group. • Copper mineralisation occurs mainly as veins and disseminations in a carbonaceous, massive to laminated dolomite. • Primary copper mineralogy comprises chalcopyrite, bornite, and chalcocite in decreasing abundance. Oxide copper mineralogy comprises primarily malachite with trace amounts of chrysocolla.
Drill hole information	• All drillhole information has been considered in estimating the Mineral Resource, and as this is a Mineral Resource report and not a public report of individual exploration results a full listing of results is not provided here.
Data aggregation methods	• Several domains and variables have a restriction on grade for the estimate. Top cut values are based on statistical analysis in effort to reduce the grade variation within the domain and preventing uncontrolled grade smearing. • No reporting of metal equivalent values has been undertaken.
Relationship between mineralisation width and intercept lengths	• This is a Mineral Resource estimate and no down hole length intervals are reported separately. All intervals have been considered within mineralised domains for the estimation of grades within the Mineral Resource. • Drill holes have been drilled on N-S sections at approximately 60° to the north. Mineralisation is oriented with an E-W strike and dipping approximately 60° to the south.
Diagrams	**Perspective view of drilling within and adjacent to the Sokoroshe II mineral deposit. Also showing high-grade domain (red)** 

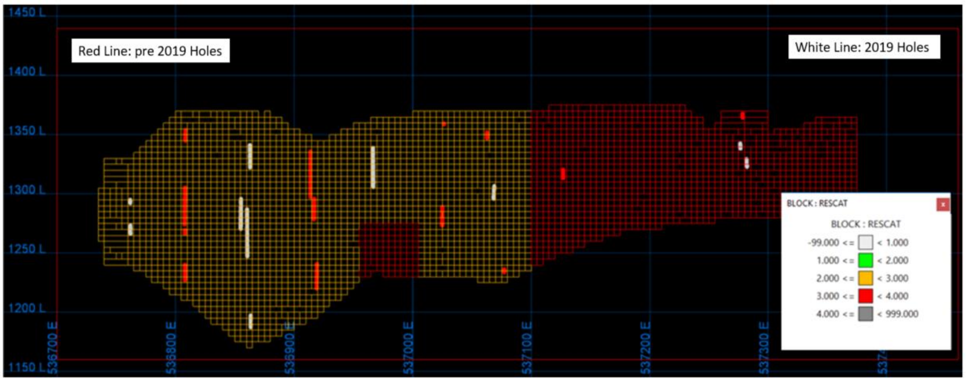
Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	Section view (536860mE) showing drilling and Cu domains. High-grade domain (red) and Low-grade domain (green)  **Additional Domains in 2019 Resource Estimate – Co, S, Ca, Mg and Mn** 

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
	   

Section 2 Reporting of Exploration Results	
Criteria	**Commentary**
Balanced reporting	• This is a Mineral Resource estimate and not a report of exploration results. • All drill holes and assay results have been considered in the construction of low- and high-grade domains for the Sokoroshe II Mineral Resource estimate.
Other substantive exploration data	• Airborne Geophysics - TEMPEST survey • Airborne EM, magnetics, and radiometric were flown at the end of 2013. A channel 7 EM conductor was identified to the East of Sokoroshe II occurrence. • Geological mapping was conducted in 2014. Mapping results indicated lithologies from the Roan stratigraphic unit, the main host rock to the mineralization. Younger lithologies were also noted from the Nguba and Kundelungu Formations. • Surface geochemistry: o Termite mound sampling on 100m x 100m grid was completed in 2014, which effectively identified copper anomalous zones within the tenement. o Airborne Geophysics - Xcalibur survey, flown in 2015 o Magnetics – effective at mapping structural and stratigraphic domains o Radiometrics - effective at mapping lithological contrasts and regolith domains.
Further work	• Further work on Sokoroshe II and the PE538 lease will focus on advancing the project to Pre-feasibility level study. This will include drilling to convert Inferred to Indicated and Measured Mineral Resources, mining design and scheduling, metallurgical testing and analysis along with all other Ore Reserve modifying factors. • Total 17 holes plan to drill soon, this including 7 RC holes and 10 diamond holes. The drilling defined by Priority 1: 6 holes and Priority 2: 11 holes. These holes are planning to convert Inferred to Indicated and extending the inferred to the East of SOKII area.  In the Map, Red trace: Priority 1 and Orange: Priority 2.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Database integrity	• The MMG Exploration database systems are SQL server and GBis/GeoBank management software. All geological and analytical data are managed in MMG's Corporate Geoscience Database. GIS data are stored in secure shared folders on the Lubumbashi server. • All data capture via GM logging profiles having strong internal validation criteria. The technician/geologist conducts first validation steps by checking intervals, description and accuracy of records on their respective toughbooks. • Validation rules are predefined in each of the database tables. Only valid codes get imported into the database. • The sampling and geochemical data are stored in a local version of SQL database that gets replicated to a similar version on the Head Office server with daily, weekly and monthly backups.
Site visits	• The Competent Person visited the Sokoroshe II site in February 2018 and has visited the Kinsevere deposit and several other oxide copper deposits in the Katanga province, which are also similar in style to the Sokoroshe II mineral deposit.
Geological interpretation	• There is reasonable confidence in the interpretation of geology which forms the domains used in the Mineral Resource estimate. • Geological interpretation of the mineral deposit is based on available drilling and reports of observed geology and structure at surface. Infill drilling has confirmed the previous geological interpretation. • Interpreted geology domains have been used to constrain blocks and grades in the model used for Mineral Resource estimation.
Dimensions	• Mineralisation is interpreted to be up to 650m along strike, 180m down dip and 30m thick. Actual dimensions are expected to vary.
Estimation and modelling techniques	• Estimation method is considered appropriate for oxide and transitional copper mineralisation at Sokoroshe II. The method included ordinary Kriging for the estimation of Cu, CuAs, and Ratio (CuAs/Cu) within hard boundaries for low- and high-grade copper domains. Maptek Vulcan software was used for estimation. Quantitative Kriging neighbourhood analysis was applied for the selection of estimation parameters. A minimum of 4 and maximum of 12 sample composites of 1m length were used. Search neighbourhood was an ellipse with orientation comparable to geological domains having a major distance of 150 metres, semi major distance of 75 metres and minor distance of 30 metres. Samples were composited to 1m interval which is the same as the nominal sample spacing in mineralised rock. Discretisation was set to 8x4x8 (x,y,z). Fe and U were included within Copper domains. • Co, Al, Ca, Mg, Mn and S have also estimated using Ordinary Kriging within individual hard boundary created using Leapfrog software. The variograms were individually calculated and modelled using Isatis software and Estimate parameters set up accordingly. • Check estimates were undertaken as basic dimensions multiplied by the density to give tonnes and grades reported from declustered statistics. In addition, a basic sectional estimate was conducted prior to block modelling. All results were found to be comparable.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
	• No assumed by-product recovery was applied; however, ratio between CuAS and Cu estimated in the block model. • Block model is not rotated with block size was 20mE by 5mN by 10mRL with sub-blocking to 5mE by 2.5mN by 2.5mRL. The block size provides a reasonable representation of the interpreted low- and high-grade domains. Block size is less than the drill hole spacing of approximately 40m sections with holes spaced 40 metres on section. However, samples are spaced at approximately 1 metre intervals down hole. • Selective mining units have not been modelled. • No assumptions have been made about correlation of variables • Geological interpretation is represented by low- and high-grade triangulations that have been used for the construction of block model domains and selection of sample composites. • No grade cutting or capping was applied for mineralised domains Cu and CuAs; although grade distributions for are positively skewed but the coefficient of variation is low (0.86) and arguably no grade restriction is required. However, grade capping was applied to waste domain and several variable such Co, Mg and Mn to control the influence of outlier values into block estimates. • Block model domains were compared against domain wireframes and found to be suitably constructed. Estimated block grades were compared against drill hole grades on sections and plans and found to be comparable. Statistics for composite samples and blocks were also compered and found to be comparable.
Moisture	• Estimated tonnes are on a dry basis.
Cut-off parameters	• Cut-off grade is 1.1% CuAs and was calculated as part of a Proof of Concept study for Sokoroshe II. Tonnes and grade are reported within an optimised pit shell based on direct shipping ore to the Kinsevere facility. Copper metal price for Mineral Resources was set at UD$3.64/lb.
Mining factors or assumptions	• The mining method is assumed to be open pit with trucks and excavators. A 30km surface haulage is also required to deliver ore to the Kinsevere Operation for mineral processing.
Metallurgical factors or assumptions	• Mineral processing is expected to be undertaken through the current Kinsevere Operation process, which involves sizing, grinding and leaching followed by solvent extraction, electrowinning to produce saleable copper cathode at LME quality.
Environmental factors or assumptions	• Environmental factors include increased land surface disturbance and required rehabilitation for this site, including final pit excavation and waste rock storage. All ore piles are expected to be transported to Kinsevere for treatment.

Section 3 Estimating and Reporting of Mineral Resources	
Criteria	**Commentary**
Bulk density	• Bulk density measurements have been undertaken using weight in air and weight in water. The samples measured have also included wax immersion to prevent over estimation due to the porous nature of oxide samples. Samples are also oven dried prior to measurement. • However, at this point the number of bulk density data is not sufficient for interpolation. Therefore, single density value used for entire SOKII 2019 Resource Estimate; which is 1.9 t/m3.
Classification	• The entire Sokoroshe II Mineral Resource has been classified as Indicated and Inferred and is supported by drill hole spacing and variogram analysis. • The classification also takes into account the spatial distribution of data as well as estimation metrics including kriging variance and kriging slope of regression. • The classification is supported by the Competent Persons view of the deposit and the available data. 
Audits or reviews	• No external audits or reviews of this Mineral Resource estimate have been undertaken.
Discussion of relative accuracy/ confidence	• The Majority (~70%) of Mineral Resource estimate is at Indicated Mineral Resource; this is supported by additional infill drilling and geostatistical analysis including variograms that produce ranges less than the drill spacing and low values for Kriging slope of regression and Kriging efficiency along with high Kriging variance. • The review of tonnage accuracy is required since the density value based on single value. • The estimate relates to global estimation and is not suitable as a local estimate. Additional drilling and Mineral Resource estimation is required before a local estimate can be delivered. • No production data is available for comparison.

7.2.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resource statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

7.2.3.1 Competent Person Statement

I, Douglas Corley, confirm that I am the Competent Person for the Sokoroshe II Mineral Resource section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australian Institute of Geoscientists and hold Registered Professional Geoscientist (RPGeo) accreditation.
- I have reviewed the relevant Sokoroshe II Mineral Resource section of this Report to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Sokoroshe II Mineral Resource section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Sokoroshe II Resources.

7.2.3.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Sokoroshe II Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____

Douglas Corley MAIG R.P.Geo. (#1505)

Date: 22/10/2019

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____

Signature of Witness:

Rex Berthelsen
Melbourne, VIC

____

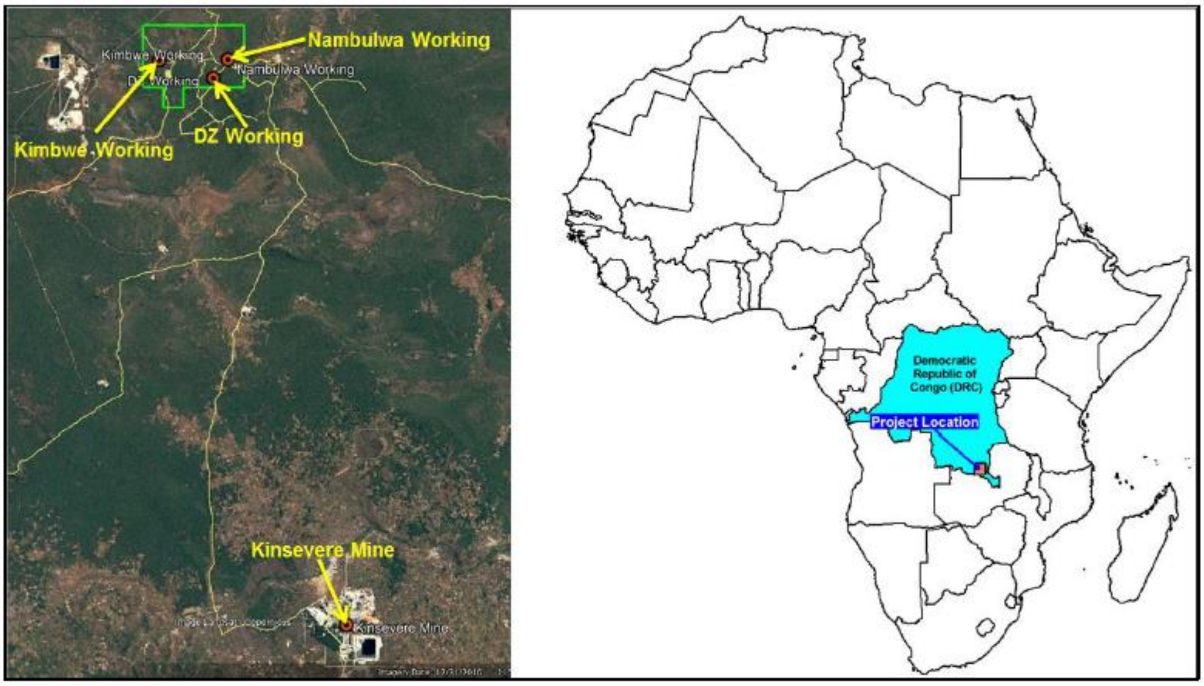
Witness Name and Residence: (e.g. town/suburb)

8 NAMBULWA / DZ

8.1 Introduction and Setting

The Nambulwa and DZ Projects are located on the license PE539 in Democratic Republic of Congo, DRC. The tenement was acquired by MMG as part of the Anvil Mining acquisition in 2012. From the Kinsevere copper (Cu) mine, the Projects are located some 30km to the NNW (Figure 8-1).

Figure 8-1 Nambulwa and DZ project location



MMG begun exploring tenement PE539 in 2014 with regional to semi-regional exploration work including geological mapping, surface geochemistry, airborne geophysical survey (magnetics, radiometrics, and EM). However, MMG was unable to continue exploring the tenement due to security threats by artisanal miners. Following this, MMG negotiated its exploration rights over PE539 with various government agencies and subsequently managed to regain full control over the tenement. As a result, all mining cooperatives and artisanal miners were evicted from the tenement and the area was secured by about 40 Mine Police under contract from MMG.

8.2 Mineral Resources – Nambulwa / DZ

8.2.1 Results

The 2019 Nambulwa/DZ Mineral Resources are summarised in Table 25. There are no Ore Reserves for Nambulwa/DZ deposits.

Table 25 2019 Nambulwa/DZ Mineral Resources tonnage and grade (as at 30 June 2019)

Nambulwa and DZ Mineral Resources

					Contained Metal		
Nambulwa Oxide Copper[2]	**Tonnes (Mt)**	**Copper (% Cu)**	**Copper (AS[1] % Cu)**	**Cobalt (% Co)**	**Copper ('000)**	**Copper AS[1] ('000)**	**Cobalt ('000)**
Measured							
Indicated							
Inferred	0.9	2.3	2.1	0.1	21	20	1.0
Total	**0.9**	**2.3**	**2.1**	**0.1**	**21**	**20**	**1.0**
DZ Oxide Copper[2]							
Measured							
Indicated							
Inferred	0.5	1.9	1.7	0.2	8.9	7.7	0.7
Total	**0.5**	**1.9**	**1.7**	**0.2**	**8.9**	**7.7**	**0.7**
Combined Total	**1.4**	**2.2**	**2.0**	**0.1**	**30**	**27**	**1.8**

[1] AS stands for Acid Soluble

[2] 0.9% Acid soluble Cu cut-off grade

All Mineral Resources except stockpiles are contained within a US$3.64/lb Cu pit shell

Contained metal does not imply recoverable metal.

Figures are rounded according to JORC Code guidelines and may show apparent addition errors.

8.2.2 Mineral Resources JORC 2012 Assessment and Reporting Criteria

The following information provided in Table 26 complies with the 2012 JORC Code requirements specified by "Table-1 Section 1-3" of the Code.

Table 26 JORC 2012 Code Table 1 Assessment and Reporting Criteria for Nambulwa/DZ Mineral Resources 2019

Section 1 Sampling Techniques and Data	
Criteria	**Explanation**
Sampling techniques	• The Mineral Resources uses a combination of reverse circulation (RC) and drilling diamond drilling (DD) to inform the estimates. • Mineralised zones within the drill core were identified based on combined parameters, including lithological and alteration logging, mineralogical logging and systematic spot pXRF readings. DD core was sampled nominally at 1m intervals within mineralised zones while unmineralised zones were sampled at up to 2-4m intervals. Sampling was carried out by longitudinally cutting PQ and HQ drill core using an Almonte automatic diamond saw and sampling half-core, with half-core retained for future reference. PQ drill core was quartered and sampled. Three-quarters of the core was retained for future reference. • RC drill cuttings were collected in 1m bulk samples from a rig mounted cyclone. Lithological and mineralogical logging, supported by systematic spot pXRF readings, were used to identify mineralised and unmineralised zones in the RC chips. Samples from mineralised zones were riffle split every 1m to obtain a representative (~2.5kg) sample. Samples from unmineralised zones were riffle split and composited to 2m intervals. Wet samples were dried in ambient air before splitting and compositing. • Air core (AC) drill cuttings were collected in 1m bulk samples from a rig mounted cyclone. Samples from zones of mineralisation were riffle split to obtain a representative (~2.5kg sample). Samples from visually unmineralised, lithologically similar zones were riffle split and composited to 3m sample intervals (~2.5kg weight). Wet samples were dried in ambient air before splitting and compositing. • Overall, 54% of the samples were less than 2m, with mineralised samples taken at nominal 1m intervals. • Samples were crushed, split and pulverised (>85% passing 75 µm) at an onsite ALS laboratory at the MMG core yard facility in Lubumbashi. 100 grams of pulp material was sent to the SANAS accredited ALS Laboratories in Johannesburg. • The sample types, nature, quality and sample preparation techniques are considered appropriate for the nature of mineralisation within the Project (sediment hosted base metal mineralisation) by the Competent Person.
Drilling techniques	• DD: PQ and HQ sizes, with triple tube to maximise recovery. At the end of each drilling run the core was marked with an orientation mark by using a REFLEX ACE tool. An orientation line was then drawn along the axis of the core if two consecutive orientations marks could be aligned by docking core pieces. • AC drilling: A blade bit was used for drilling a 3.23-inch (82mm) hole. The cyclone was manually cleaned at the start of each shift, after any wet samples, and after each hole. Compressed air from the drilling machine was used to clean/blow out material from the AC rods, hoses, and cyclone after each rod.

Section 1 Sampling Techniques and Data	
Criteria	**Explanation**
	• RC drilling: A hammer bit was used for drilling a 5.25-inch (133mm) diameter hole. The cyclone was manually cleaned at the start of each shift, after any wet samples, and after each hole. Compressed air from the drilling machine was used to clean/blow out material from the RC rods, hoses, and cyclone after each rod.
Drill sample recovery	• Overall DD core recovery averaged 83% across the Project area. As expected, the recovery dropped in unconsolidated/highly weathered ground. Below 50m, core recovery averaged 85%, and below 100m, core recovery averaged 89%. • Actual vs. recovered drilling lengths were captured by the driller and an onsite rig technician using a tape measure. Measured accuracy was down to 1cm. The core recoveries were calculated during the database exports. • Sample recovery during diamond drilling was maximised using the following methods: o Short drill runs (~50cm) o Using drilling additives, muds and chemicals to improve broken ground conditions. o Using the triple tube methodology in the core barrel. o Reducing water pressure to prevent washout of friable material • Drilling rates varied depending on the actual and forecast ground conditions • Core loss was recorded through the core and assigned to intersections where visible loss occurred. Cavities were noted. • Bias due to core loss has not been determined. • RC and AC cuttings recovery was measured by weighing each 1m sample bag immediately following collection from the cyclone. • Sample returns for RC and AC drilling have been calculated at 62% and 63% respectively. • Sample recovery during RC drilling was maximized using the following methods: o Adjusting air pressures to the prevailing ground condition. o Using new hammer bits and replacing when showing signs of wear.
Logging	• DD core, RC chips and AC chips have been geologically logged and entered into the MMG database (Geobank). The level of detail supports the estimation of Mineral Resources. Additional geotechnical logging is required for further studies of the deposit. • Qualitative logging includes lithology, mineralisation type, oxidation type, weathering type, colour and alteration types. Quantitative logging includes mineralisation mineral percentage, alteration mineral percentage and in the case of core, RQD and structural data have been recorded. • All the core and chip samples were photographed both wet and dry. • 100% of core and chips have been logged with the above information.
Sub-sampling techniques and	• DD core was split in half longitudinally (HQ size) or quartered (PQ size) using an Almonte automatic diamond saw.

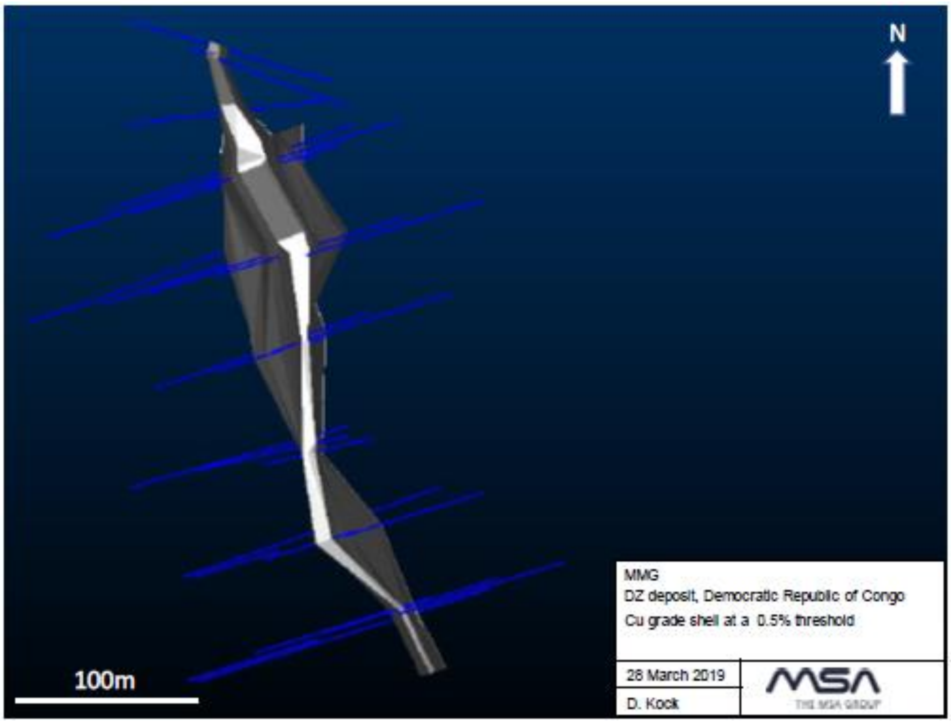
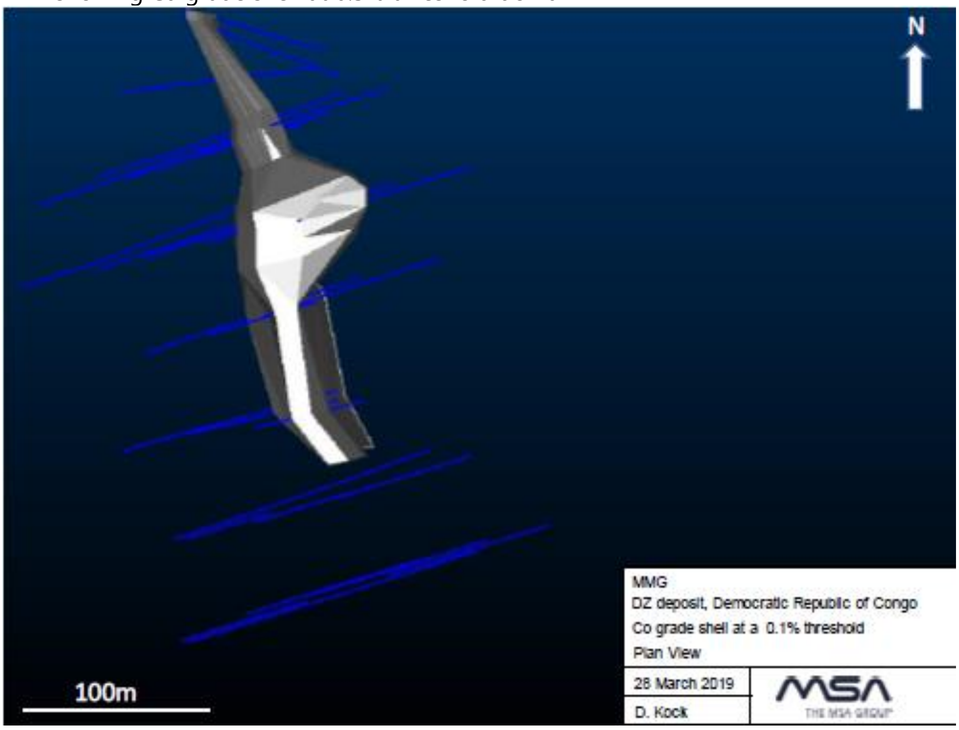
Section 1 Sampling Techniques and Data	
Criteria	**Explanation**
sample preparation	• Sample lengths were cut as close to nominal 1m intervals as possible while also respecting geological contacts. Samples were generally ~2.5kg in weight. • RC and AC samples were collected from a cyclone every meter by a trained driller's assistant. If the sample was dry the sample was passed through a riffle splitter and a ~2.5kg split was collected into a pre-numbered calico bag. Residual material was sampled and sieved for collection into chip trays for logging and the remainder returned to the larger poly-weave bag (bulk reject). The splitter was cleaned using compressed air or a clean brush and tapped using a rubber mallet. If the sample was wet, the sample was air dried before being split according to the above procedure. • For RC and AC methods, field duplicates were inserted at a rate of approximately 5% to ensure sampling precision was measured. • Samples from individual drillholes were sent in a single dispatch to the onsite ALS laboratory at the MMG core yard facility in Lubumbashi. • Samples were received, recorded on the sample sheet, weighed, and dried at 105°C for 4 to 8 hours (or more) depending on dampness at the sample preparation laboratory. • Samples were crushed and homogenised in a jaw crusher to >70% passing 2mm. The jaw crusher was cleaned with a barren quartz blank after every crushed sample. • The sample size was reduced to 1000g in a riffle splitter and pulverised in an LM2 pulveriser to >85% passing 75 micron. QC grind checks were carried out using wet sieving at 75 micron on 1 in 10 samples. • 100 grams of pulp material were sent to the SANAS accredited ALS Laboratories in Johannesburg. • Crush and pulp duplicates were submitted for QAQC purposes. • Certified reference material (high, medium, and low copper grades) were also inserted and submitted to ALS for analysis at a rate of 3 per 30 samples. • The sample size is appropriate for the grain size and distribution of the minerals of interest.
Quality of assay data and laboratory tests	• All samples were sent to ALS Chemex Laboratory in Johannesburg • Samples were analysed using a 4-acid digest with ICP MS finish. 48 elements were analysed in total. • Acid soluble copper assays were only performed when the total copper assay was greater than 1,000 ppm. • ~15% QAQC samples were incorporated, including blanks, duplicates (field, crush, and pulp) and certified reference material per sample analysis batch. • QAQC data has been interrogated with no significant biases or precision issues. • No geophysical tools, spectrometers, or portable XRF instruments have been used for estimation purposes.

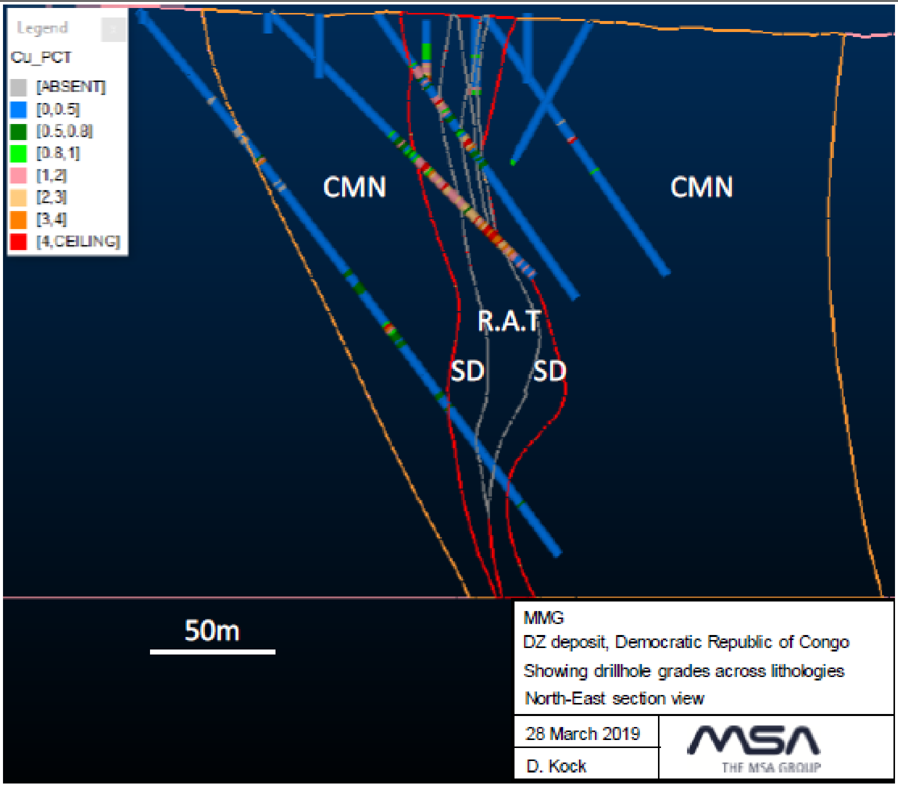
Section 1 Sampling Techniques and Data	
Criteria	**Explanation**
Verification of sampling and assaying	• Significant intersections have been reviewed by competent MMG employees. • No twin drilling was completed. • Primary data is stored in a Geobank database, which is maintained according to MMG database protocols. Data is logged, entered and verified in the process of data management. Database is stored on MMG server and routinely backed up. • No adjustment has been made to assay data.
Location of data points	• Planned collar positions for both diamond drilling and RC drilling were located using handheld GPS devices to ±5m accuracy. • Post drilling, actual collar positions were surveyed using DGPS (Geomax Zenith 25 Pro and Topcon Hiper II) and are of high accuracy. • Grid system is in WGS84/UTM35S • Topographic control was by a detailed aerial drone survey. • The TN14 GYROCOMPASS™ was used to align the drill rig to the correct azimuth and dip angles. • Downhole surveys were done using the REFLEX EZ-TRAC survey instrument. Downhole surveys were not carried out on RC & AC drillholes.
Data spacing and distribution	• Drill spacing is variable between prospects. Average drill hole data are spaced at ~50 to 100m between drill sections. Holes on sections are spaced at ~25-50m apart. • 2m or 4m composites were taken in zones of no visual mineralisation (3m composites for AC drilling) • Nominal 1m samples were taken in zones of mineralisation. • No other sample compositing has occurred.
Orientation of data in relation to geological structure	• DD and RC drillholes were predominantly drilled with dips of between 45° and 60° to intersect generally steeply dipping mineralisation. Drilling azimuths were as close as practical to orthogonal to the mineralised trend. The AC drillholes were drilled vertically. • In the view of the Competent Person, no bias has been introduced by the drilling direction.
Sample security	• Samples were transported from the field and delivered to the sample processing facility in Lubumbashi for cutting and preparation. A single cab pick-up was used for the transport. Polyethylene foam, tarpaulins, and cargo nets were used to secure the load and to avoid possible shifting of core during transport. • RC chip sampling was conducted in the field. Chip samples were packed in a labelled plastic bag along with a labelled plastic ID tag. • The plastic bag was tied with cable ties to secure the sample and to prevent contamination. • A set of 15 plastic sample bags were packed into labelled poly-weave bags, ready to be shipped from the field to the sample preparation laboratory in Lubumbashi.

Section 1 Sampling Techniques and Data	
Criteria	**Explanation**
	• Field packing documents and sample sheets were prepared and sent together with the core trays and poly-weave bags to the sample preparation laboratory in Lubumbashi. • After sample preparation, bar-coded envelopes of 100-200g of pulp for each sample were inserted into boxes of ~40 envelopes each, labelled with dispatch ID and laboratory destination to be sent by DHL courier to ALS Chemex in Johannesburg. • Two sets of duplicate pulps of 100-200g were inserted into labelled boxes of ~40 envelopes each to be stored on site in storage containers. • The shipment of pulps from Lubumbashi to ALS laboratories was done using DHL Courier services with waybill number for tracking. • The Lubumbashi sample preparation laboratory utilizes the ALS-Chemex LIM System installed at Kinsevere mine site, generating a unique lab workorder for each batch sample in the analytical chain.
Audit and reviews	• No external audits or reviews of sampling techniques and data have been conducted. • Data has been reviewed by the Competent Person as part of this Mineral Resource estimate. No significant issues were identified.

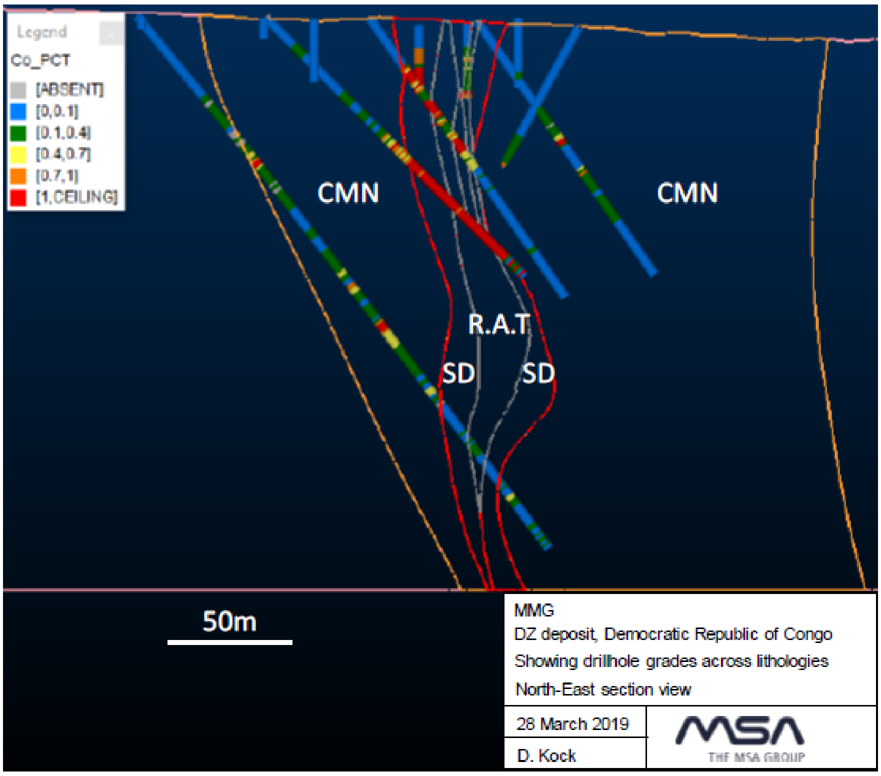
Section 2 Reporting of Exploration Results	
Criteria	**Status**
Mineral tenement and land tenure status	• The Nambulwa Project is located within lease PE539 (100% Gecamines) in the DRC. The lease was acquired by MMG as part of the Kinsevere Amodiation agreement with Gecamines. The tenement is valid through to April 3, 2024.
Exploration done by other parties	• Union Miniere (UMHK) explored the Nambulwa Project during the 1920s. UMHK conducted trenching, pitting and tunnelling, mainly at Nambulwa Main. • Gecamines explored the Nambulwa Project during the 1990s. Work completed included mapping, pitting, and limited drilling at Nambulwa Main. • Anvil Mining explored the Nambulwa Project between September and December 2007 and was the first company to effectively define a resource. Anvil's initial phase of exploration included geological mapping, termite mound sampling, AC drilling (11,830m), RC drilling (6,268m), and DD drilling (668m) focussed on PE539 and the surrounding tenements. An unclassified resource of 1.1Mt of ore @ 3.3% Cu or 35,000 t of copper metal was estimated for Nambulwa Main.
Geology	• Stratiform sedimentary hosted copper and cobalt. • Mineralisation is hosted by the Neoproterozoic Katanga Supergroup within the R2 (Mines Series), R3 (Kansuki Fm), and R4 (Mwashya Fm) stratigraphy.

Section 2 Reporting of Exploration Results	
Criteria	**Status**
	• Copper mineralisation is both lithologically and structurally controlled and occurs mainly as veins and disseminations in dolomitic units, carbonaceous shale, and massive to laminated dolomite. • Oxide Cu is hosted mainly in the dolomitic units, whereas sulphides (chalcocite, digenite) are hosted in the black shale unit. Oxide copper mineralogy includes malachite and other black-oxides and they are sometimes associated with elevated Co mineralisation. Sulphide (chalcocite ± chalcopyrite-bornite) mineralisation is found in deeper levels of the deposits.
Drill hole information	• All drillhole information has been considered in estimating the Mineral Resource, and as this is a Mineral Resource report and not a public report of individual exploration results a full listing of results is not provided here.
Data aggregation methods	• This is a Mineral Resource Statement and is not a report on exploration results hence no additional information is provided for this section. • No metal equivalents were used in the Mineral Resource estimation.
Relationship between mineralisation width and intercept lengths	• This is a Mineral Resource estimate and no down hole length intervals are reported separately. All intervals have been considered within mineralised domains for the estimation of grades within the Mineral Resource. • DD and RC drillholes were predominantly drilled with dips of between 45° and 60° to intersect generally steeply dipping mineralisation. Drilling azimuths were as close as practical to orthogonal to the mineralised trend. The AC drillholes were drilled vertically.

Diagrams	**Perspective view of drilling within and adjacent to the DZ mineral deposit.**  DZ - showing Cu grade shell at 0.5% threshold domain  DZ - showing Co grade shell at 0.1% threshold domain **Sectional views of DZ**

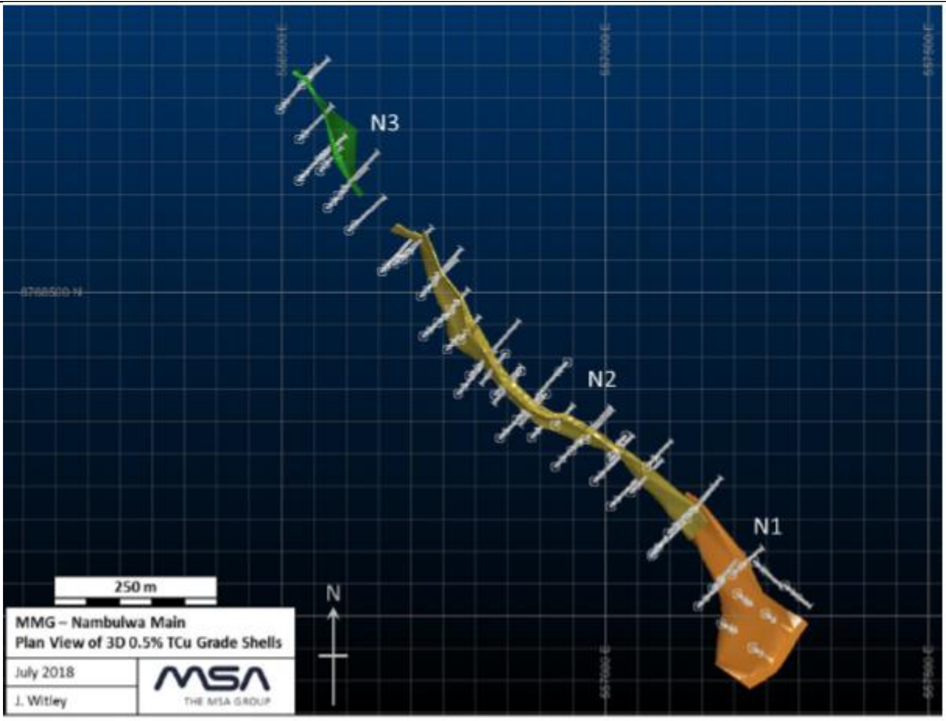
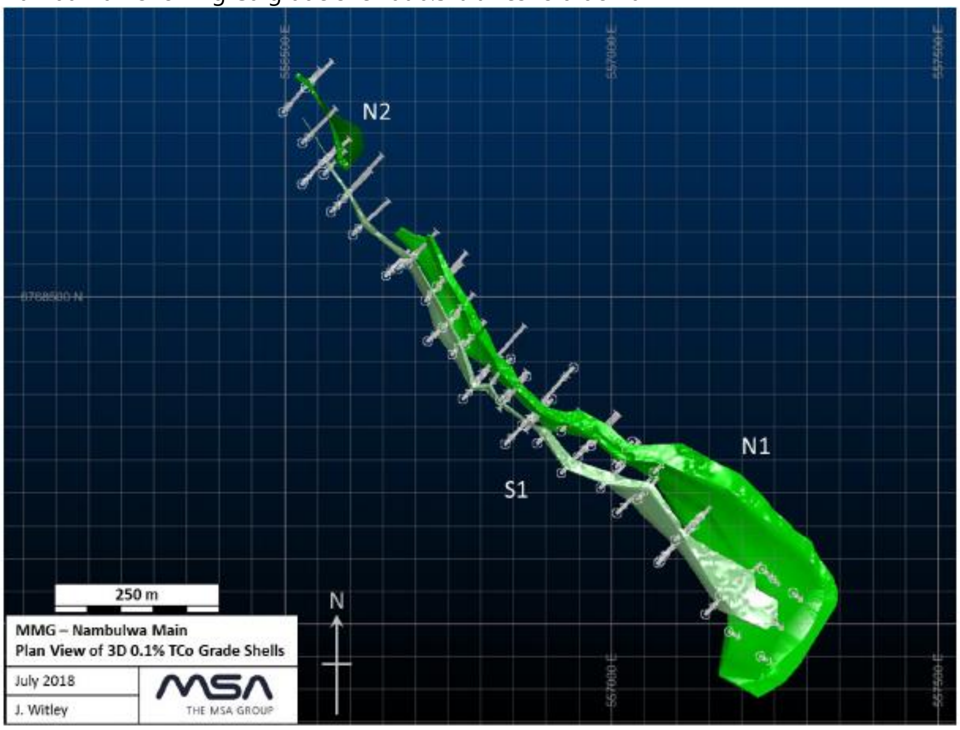


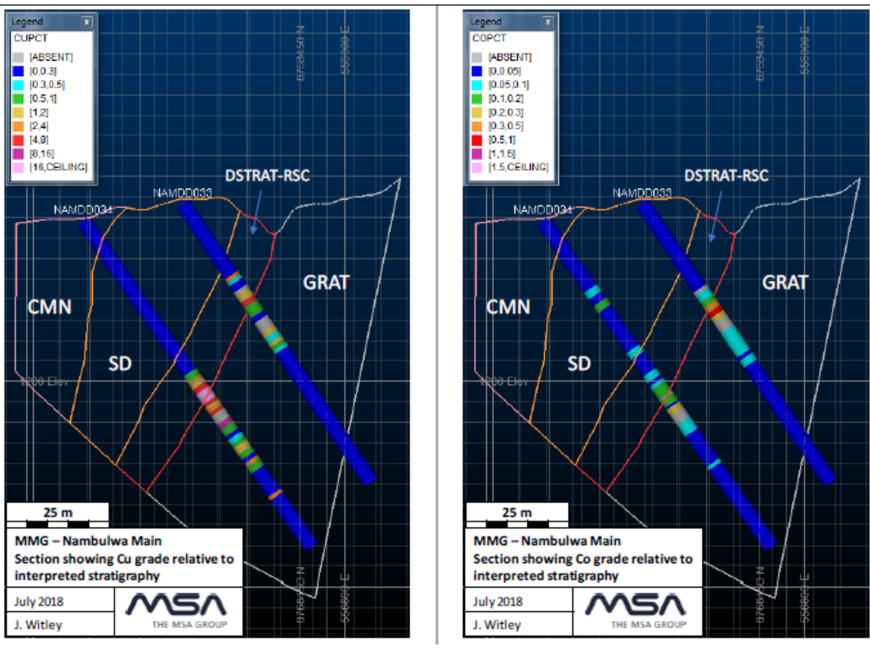
DZ – Section showing stratigraphy vs drillhole grade (Cu)



DZ – Section showing stratigraphy vs drillhole grade (Co)

Perspective view of drilling within and adjacent to the Nambulwa mineral deposit.

	Nambulwa - showing Cu grade shell at 0.5% threshold domain Nambulwa - showing Co grade shell at 0.1% threshold domain

<table>
<tr><th colspan="2">Section 2 Reporting of Exploration Results</th></tr>
<tr><th>Criteria</th><th>Status</th></tr>
<tr><td></td><td>

Nambulwa – Section showing stratigraphy vs drillhole grade (Cu left / Co right)</td></tr>
<tr><td>Balanced reporting</td><td>• This is a Mineral Resource estimate and not a report of exploration results.
• All drill holes and assay results have been considered in the construction of Cu and Co domains for the Nambulwa and DZ Mineral Resource estimates.</td></tr>
<tr><td>Other substantive exploration data</td><td>• Airborne Geophysics - TEMPEST survey, Airborne EM, magnetics, and radiometric were flown at the end of 2013. 3D inversion of the EM data identified a prominent conductor body over the western, central and eastern section of the Project.
• Geological mapping was conducted in 2014 and 2017. Mapping results outlined the presence of the geologically prospective rock units that are the main host rock to the mineralisation. Younger lithologies were also noted from the Nguba and Kundelungu Formations.
• Surface geochemistry: Termite mound sampling on 100m x 100m grid was completed in 2014, which effectively identified copper anomalous zones within the tenement. Additional geochemical surveys include 50m x 50m soil sampling conducted in 2017.
• Airborne Geophysics - Xcalibur survey, flown in 2015
• - Magnetics – effective at mapping structural and stratigraphic domains
• - Radiometrics - effective at mapping lithological contrasts and regolith domains.
• Ground IP and AMT survey – helped in mapping the conductive and resistive bodies at depth.</td></tr>
<tr><td>Further work</td><td>• Further work on Nambulwa and DZ will focus on advancing the project to Pre-feasibility level study. This will include drilling to convert Inferred to Indicated and Measured Mineral Resources, mining design and scheduling, metallurgical testing and analysis along with all other Ore Reserve modifying factors.</td></tr>
</table>

Criteria	Status
Section 3 Estimating and Reporting of Mineral Resources	
Database integrity	• The MMG Exploration database systems are SQL server and Geobank (Micromine) management software. All geological and analytical data are managed in MMG's Corporate Geoscience Database. GIS data are stored in secure shared folders on the Lubumbashi server. • All data capture via Microsoft Excel logging templates. • Multiple data validation steps conducted by the geologist and database team. Validation rules are predefined in each of the database tables. Only valid codes get imported into the database. • The sampling and geochemical data are stored in a local version of SQL database that gets replicated to a similar version on the Head Office server with daily, weekly and monthly backups.
Site visits	• The Competent Person visited the Nambulwa and DZ sites in July 2018 and January 2019 and has visited the Kinsevere deposit and several other oxide copper deposits in the Katanga province, which are also similar in style to the Nambulwa and DZ mineral deposit.
Geological interpretation	• High degree of confidence in the lithological model and geological setting. • Grade shell have been constructed aligned with the stratigraphy although they can cross cut stratigraphic contacts. • A 0.5% total copper threshold was used for copper grade shell and a 0.1% total cobalt threshold was used for the cobalt grade shells. These thresholds allowed for continuity of mineralisation from one drilling section to the next. • Alternative interpretations of the mineralisation controls exist and there may be a structural control in addition to the stratigraphic control. These are unlikely to significantly affect the total quantity of Mineral Resources. • The grade shells appear to have been offset in places by faulting. Structures trending at a close angle to the mineralisation may occur.
Dimensions	**Nambulwa** • Strike length is approximately 1.1 km. • The modelled copper mineralisation is between approximately 2m and 15m wide. Cobalt mineralisation reached 40 m wide. • Mineralisation occurs from surface along most of the strike length. In some areas drilling did not identify mineralisation near surface, despite artisanal mining, and the mineralisation extends from as deep as 60 m below surface. • The host rocks are terminated by a low angle fault at depths of between 50m and 150m. • The mineralisation is subvertical over most of the area but flattens to the southeast. **DZ** • Strike length is approximately 500m (Adjacent to Nambulwa). • The modelled copper mineralisation is between approximately 5m and 80m wide, reaching a maximum thickness in the centre (bulge area).

Criteria	Status
Section 3 Estimating and Reporting of Mineral Resources	
	• Mineralisation occurs from surface along most of the strike length. In some areas drilling did not identify mineralisation near surface. • The mineralisation is subvertical over most of the area, with a bulging shape in the middle of the grade shells.
Estimation and modelling techniques	A similar estimation strategy was used for Nambulwa and DZ and is summarised below: • A 0.5% total copper threshold was used for copper grade shell and a 0.1% total cobalt threshold was used for the cobalt grade shells. • Grade estimation was completed using ordinary kriging for total copper and cobalt and inverse distance weighting for density, Ca, Mg and acid soluble ratios using Datamine RM software. Data were composited to 1 m. • Top cuts were applied to statistical outliers where necessary. • Search distances used based on multiples of the variogram ranges. • The wireframe models were filled with parent cells 5m x 5m x 10 m (x,y,z). The parent cells were split to sub-cells of a minimum of 1m x 1m x 1m. The drillhole spacing is approximately 50m strike by 25m on dip. The small block size was chosen due to the orientation of the grade shells rather than on a geostatistical basis. • Each lithological and grade shell wireframe was filled and coded for zonal estimation so that the model contains lithological codes and grade shell codes. The coding included a code for the low Ca surface that represents the base of deep weathering. • Ca, Mg and density were estimated by lithology separately above and below the low-Ca surface. • A waste model was created that covered the area containing any elevated copper and/or cobalt grades. • No SMU was considered • Bivariate analysis was carried out to determine relationships between the attributes of interest. All elements were estimated individually there being no discernible relationship between copper and cobalt and acid soluble values. • Hard boundaries were used so that estimation was within grade shells. • The block model grade was compared to drillhole data visually, statistically and by comparing average grades of the drillhole data and model in 50 m slices through the deposit. • No reconciliation data was available. • No previous estimates have been carried out.
Moisture	• Estimated tonnes are on a dry basis with density measurements being in-situ dry bulk densities.
Cut-off parameters	• Cut-off grade is 0.9% acid soluble copper (CuAs) and was calculated as part of a Proof of Concept study for both Nambulwa and DZ. Tonnes and grade are reported within an optimised pit shell based on direct shipping ore to the Kinsevere facility. Copper metal price for Mineral Resources was set at UD$3.64/lb.

Criteria	Status
Section 3 Estimating and Reporting of Mineral Resources	
Mining factors or assumptions	• The mining method is assumed to be open pit with trucks and excavators. A 30km surface haulage is also required to deliver ore to the Kinsevere Operation for mineral processing.
Metallurgical factors or assumptions	• Mineral processing is expected to be undertaken through the current Kinsevere Operation process, which involves sizing, grinding and leaching followed by solvent extraction, electrowinning to produce saleable copper cathode at LME quality.
Environmental factors or assumptions	• Environmental factors include increased land surface disturbance and required rehabilitation for this site, including final pit excavation and waste rock storage. All ore piles are expected to be transported to Kinsevere for treatment.
Bulk density	• Bulk density measurements have been undertaken using weight in air and weight in water. The samples measured have also included wax immersion to prevent over estimation due to the porous nature of oxide samples. Samples are also oven dried prior to measurement. • Measurements are undertaken on each hole within specific lithological units and on mineralised intersections. • In-situ bulk density estimated into each block using inverse distance squared
Classification	**DZ** • The model was classified as Inferred where informed by a grid of mineralised intersections. • Inferred Mineral Resources were extrapolated a maximum of 50m from the nearest drillhole. • Where an unmineralised intersection occurs within the drillhole grid, the Mineral Resource was constrained to a distance half way between the nearest mineralised intersection and the unmineralised intersection. • Mineralisation inside and outside the modelled grade shells was separately tabulated as additional mineralisation. • No Measured or Indicated Mineral Resources were reported, mainly due to geological uncertainty. **Nambulwa** • The model was classified as Inferred where informed by a grid of mineralised intersections. • Inferred Mineral Resources were extrapolated a maximum of 60m from the nearest drillhole. • Where an unmineralised intersection occurs within the drillhole grid, the Mineral Resource was constrained to a distance half way between the nearest mineralised intersection and the unmineralised intersection. • The Mineral Resource was constrained above the interpreted basal fault. • Mineralisation outside the modelled grade shells was not classified as Mineral Resource.

Criteria	Status
Section 3 Estimating and Reporting of Mineral Resources	
	• The copper and cobalt models were classified separately and then the highest classification was applied as the final classification. • No Measured or Indicated Mineral Resources were reported due to uncertain grade continuity. • The classification of both deposits is supported by the Competent Persons view of the deposit and the available data.
Audits or reviews	• No external audits or reviews of this Mineral Resource estimate have been undertaken.
Discussion of relative accuracy/ confidence	**For both Nambulwa and DZ** • The Inferred Mineral Resources are informed by drilling and extrapolation is minimal. Mineral Resources informed by sparse drilling are low confidence estimates that may change significantly with additional data. It cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated Mineral Resource as a result of continued exploration. • Inferred Mineral Resources are not suitable for detailed technical and economic evaluation. • Although block model estimates have been carried out, local estimates are likely to be inaccurate. • No production data is available for comparison as no mining has been conducted on this deposit.

8.2.3 Statement of Compliance with JORC Code Reporting Criteria and Consent to Release

This Mineral Resource statement has been compiled in accordance with the guidelines defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("2012 JORC Code").

8.2.3.1 Competent Person Statement

I, Douglas Corley, confirm that I am the Competent Person for the Nambulwa and DZ Mineral Resource section of this Report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member of The Australian Institute of Geoscientists and hold Registered Professional Geoscientist (RPGeo) accreditation.
- I have reviewed the relevant Nambulwa and DZ Mineral Resource section of this Report to which this Consent Statement applies.

I am a full-time employee of MMG Ltd. at the time of the estimation.

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

I verify that the Nambulwa and DZ Mineral Resource section of this Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to the Nambulwa and DZ Mineral Resources.

8.2.3.2 Competent Person Consent

Pursuant to the requirements Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

With respect to the sections of this report for which I am responsible – the Nambulwa and DZ Mineral Resources - I consent to the release of the 2019 Mineral Resources and Ore Reserves Statement as at 30 June 2019 Executive Summary and Technical Appendix Report and this Consent Statement by the directors of MMG Limited:

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____

Douglas Corley MAIG R.P.Geo. (#1505)

Date: 22/10/2019

This signature was scanned for the exclusive use in this document – the *MMG Mineral Resource and Ore Reserve Statement as at 30 June 2019* – with the author's approval. Any other use is not authorised.

____

Signature of Witness:

Rex Berthelsen
Melbourne, VIC

____

Witness Name and Residence: (e.g. town/suburb)

9 HIGH LAKE

This Mineral Resources remains unchanged since reporting in 2013. This information can be found in the 2013 MMG Mineral Resources and Ore Reserves Statement as at 30 June 2013 Technical Appendix.

10 IZOK LAKE

This Mineral Resources remains unchanged since reporting in 2013. This information can be found in the 2013 MMG Mineral Resources and Ore Reserves Statement as at 30 June 2013 Technical Appendix.