



# MONTEZUMA

MINING COMPANY LTD

Montezuma Mining Company Limited (ASX: MZM) continued to further advance its exploration and evaluation activities during the quarter ended 30 June 2014:

- ◆ Targeted tenement acquisition ongoing in Western Australia
- ◆ Continued review of investment and acquisition targets
- ◆ Refinement of Butcherbird manganese processing route options
- ◆ Alternatives to reduce energy demand identified
- ◆ Potential to reduce scale of tailings infrastructure and water consumption

## Corporate

In line with the Company's growth strategy to utilise Montezuma's strong cash position and build a diversified resource asset base, a number of potential investment and acquisition opportunities were reviewed during the quarter ended 30 June 2014. Several opportunities did not meet the Company's investment criteria, however, the successful Woodie Woodie West negotiations resulted in an agreement for Montezuma to earn a 75% interest in the project as announced on 7<sup>th</sup> of July 2014.

In line with the Company's stated ambition to acquire a near term production asset, Montezuma is in discussion with parties holding assets that could potentially be in production within a short timeframe. The Company continues to actively target tenement acquisition within Western Australia and considering selected low risk overseas jurisdictions where compelling geology and early mover advantage presents potential favourable opportunities.

30 JUNE 2014

QUARTERLY REPORT

### ABOUT MONTEZUMA MINING

Listed in 2006, Montezuma Mining Company Ltd (ASX: MZM) is a diversified explorer primarily focused on manganese, copper and gold. The Company's primary objective is to achieve returns for shareholders through selected strategic acquisitions and targeted exploration programs.

### MARKET DATA

ASX code:	MZM
Share price:	\$0.19
Shares on issue:	70,464,350
Market capitalisation:	\$13.3m
Cash as at 30 June 2014:	\$8.7m

### BOARD AND MANAGEMENT

Chairman	Seamus Cornelius
Executive Director	Justin Brown
Non-Executive Director	John Ribbons
Chief Executive Officer	Mike Moore



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# Butcherbird (100%)

Metallurgical studies on material recovered from the completed 14 hole, HQ sized (63 mm diameter) diamond drilling program totalling 474 metres (BBDD010 to BBDD023) continued during the June 2014 quarter. The HQ diamond drilling program samples will assist in enhancing the Company's understanding of the processing route options and more clearly define the ultimate manganese product specification.

## PROCESS DEVELOPMENT

Preliminary results for the scrubbing only and scrubbing plus dense media separation ("DMS") indicated that a product grade of about 31.5 % Mn could be achieved by scrubbing alone and of nearly 33 % Mn by dense media beneficiation of the scrubber product in particle sizes above 6.3 mm. Manganese recovery of greater than 70 % is possible and provides significant encouragement.

## ORE SORTING PROCESS ROUTE

Ore sorting is a process for upgrading mineral bearing rock at large particle sizes, typically between 250mm and 10mm and involves evaluating the mineral content of individual rocks when passed through a sensor then separating into Accept and Reject fractions, based on pre-determined selection criteria. Ore Sorting requires a property specific to an ore to be sensed and then optimised for each application. Depending on particle size range of the material being treated, ore sorting machines can operate at throughput rates up to 200 tonnes per hour per machine.

Samples of two typical core intercepts from the upper saprolitic/manganiferous zones were submitted to Steinert Australia Pty Ltd ("Steinert"). Steinert have evaluated several selected specimens of manganese mineral and of the saprolitic gangue. These core samples were tested through Steinert's German facilities.

X-ray transmission ore-sorter products have been by received at Australian Laboratory Services ("ALS"). These products where the gangue (Reject) from the ore sorter drops un-hindered through the sorter and a concentrate (Accept) of individual particles identified by their high absorption of x-radiation are ejected by an air-blast into a separate stream accept stream.

It was agreed that the ore sorter "drop" material (Reject) should be crushed, split, pulverised and chemically analysed. The ore sorter manganese concentrate (Accept) should be scrubbed identically to the whole ore scrubbing process. The fines and slime from scrubbing were to be analysed and the scrubbed lump subjected to densimetric fractionation and fractional analysis. The ore sorter feed would be determined by summation of these products.

Ore sorter concentrate scrubbing has been conducted and the scrubber product samples delivered for Individual Particle Pycnometry (IPP) densimetric fractionation in four sizes, ranging from larger than 31.5 mm to 6.3 mm to 8.0 mm. IPP is an accurate technique for separating sample material into discrete fractions based upon the apparent water-saturated density of each particle. IPP is an accurate and cost effective method of performing densimetric analysis on lump mineral particles than traditional use of heavy liquids. IPP does not involve the use of noxious, toxic and expensive heavy liquids and the density fractionation has no upper limit as is the case for the use of heavy liquids.

The scrubbed ore sorter product in each size range was separated into 21 density fractions of 0.1 kg/L each. The density fractions were chemically analysed by the routine instrumental technique of X-ray fluorescence. The mass, mean density and analyses of each fraction at each size can then be used to simulate the performance of any commercial densimetric beneficiation process.

In the case of Butcherbird scrubbed ore sorter product the separation simulation was for dense media cyclone (DMC) beneficiation in the individual particle size ranges. The indicative results from the ore sorting/scrubbing/densimetric analysis indicate that a final concentrate grade similar to that achieved by the whole ore scrubbing route will be achieved, however, at a manganese recovery of approximately 10% less than by the whole ore route, for instance a manganese recovery of approximately 64 %, from similar ore and achieving a similar product grade of approximately 32 % Mn.

The lower recovery by the ore-sorter pre-concentration route is attributable to the quality of separation achievable through an ore sorter. The ore sorter process route will reject approximately 60% of feed in size ranges larger than 16 mm, equivalent to approximately 25 % of the ore. Potentially 20 % of the ROM feed may be discarded by dry screening and rejecting minus 6.3 mm ore. It has been shown that the minus 6.3 mm ore has a grade of only approximately 2.5 % manganese and is potentially uneconomic to beneficiate.

The use of ore sorting and discarding of minus 6.3 mm ore would reduce scrubber feed and DMS feed by approximately 45 %. This reduction in high energy demand processes will significantly reduce overall operating cost compared to the simple whole ore process route. A further benefit of ore sorting is minimising the tailings disposal facility size and water consumption.

### **WHOLE ORE SCRUBBING PROCESS ROUTE**

The necessary testwork and analytical results for the whole ore scrubbing route with and without densimetric beneficiation have been received and all the data is available for evaluation.

Earlier indicative results have been confirmed as follows:

Whole Ore Scrubbing plus DMS			
Feed Mn grade %	Yield %	Recovery %	Mn Grade %
11.69	25.47	71.16	32.66

**Table 1: Whole ore scrubbing with DMS**

The energy cost of this route may be reduced by rejecting minus 6.3 mm ore before scrubbing, increasing the complexity of the otherwise simple process. The capital cost would remain similar because of inclusion of a large dry screen and material handling equipment would discount the reduction in scrubber capital cost.

### **COMPARISON OF BENEFICIATION PROCESS ROUTES**

Analytical data for all variations of the two process routes will be evaluated during August 2014. The decision regarding the selection of the ore beneficiation process route must be based on a full financial comparison of the options (including expected operational delays in more complex facilities).

### **HYDROMETALLURGICAL DEVELOPMENT**

It has been considered possible that some of the mineral grade (the actual manganese content of the cryptomelane-like mineral) may be less than that acceptable by the current manganese ore market. If proven correct, a process route for hydrometallurgical treatment of an upgrading of sub-market grade ores has been postulated.

Excess pulverised concentrate samples were collected from ALS to constitute feed to a novel hydrometallurgical route for production of super-high grade manganese from potential sub-marketable grade ore. A quotation for a hydrometallurgical route has been received and will be considered once the current phase of testwork has been completed.



## CONCLUSION

Results gained from this recent round of test work has allowed further reinforcement of the basic processing route required to deliver a clean >6.3 mm manganese product. A production rate of 0.5 Mt per annum of manganese and utilising conventional open pit mining techniques would provide a 20 year mine life for the Butcherbird project with options to expand further resources. The project is located favourably in terms of infrastructure with the Great Northern Highway running through the tenement as well as the Goldfield's Gas Pipeline. The town of Newman located 125 km to the north is a significant industrial and commercial hub for the region and has daily air services to Perth.

The Company is targeting consumers who are seeking long term supply of consistent grade manganese product with low deleterious element contamination.

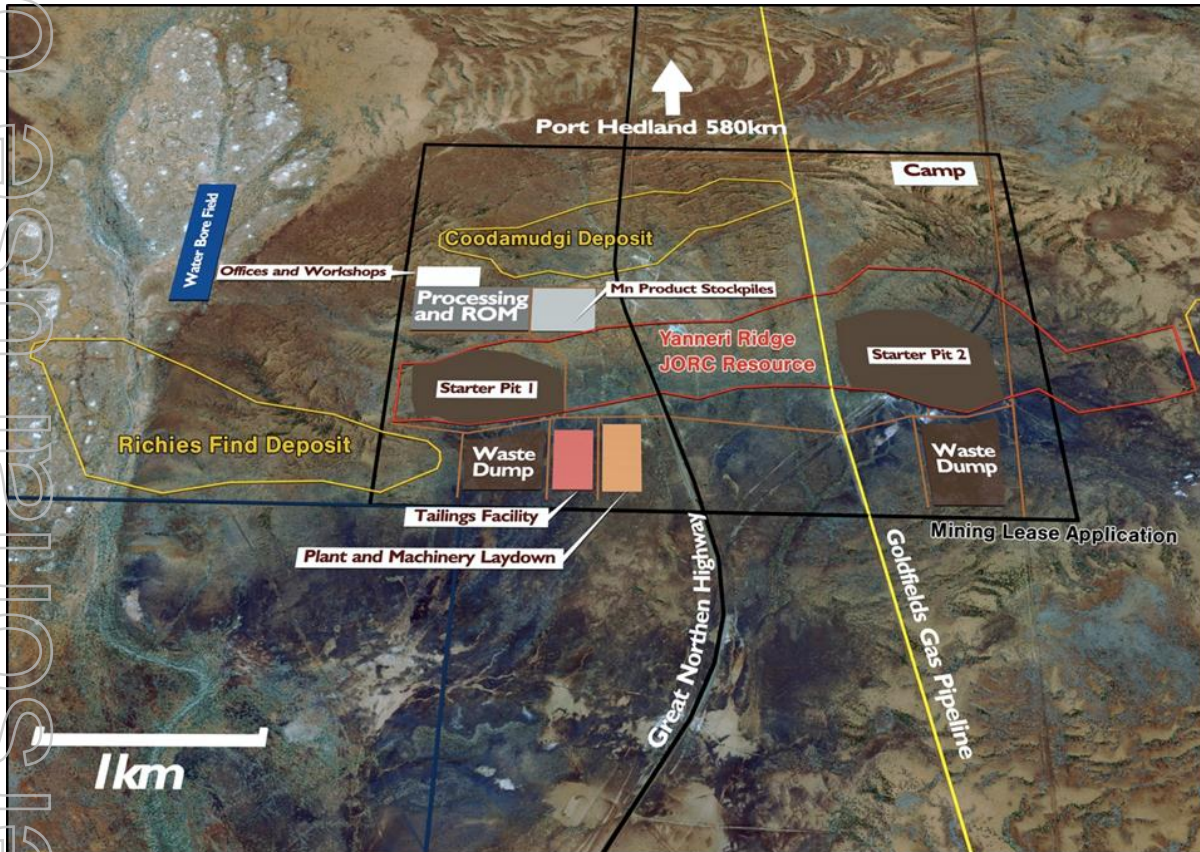


Figure 1. Conceptual mine layout plan showing key infrastructure within the Butcherbird Mining Lease Application surrounded by the Company's exploration tenure.

## FOR MORE INFORMATION...

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*The Information in this report that relates to exploration results is based on information compiled by Mr Justin Brown, who is a member of the Australian Institute of Mining and Metallurgy. Mr Brown is a geologist who is a full time employee of Montezuma Mining Company Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Brown consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

*The Information in this report that relates to metallurgical testing results is based on information compiled by Dr Tony Mason, who is a Fellow of the Institute of Materials, Minerals and Mining (FIMMM). Dr Mason is a consulting metallurgist who is a full time employee of Mineral Processors (WA) Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Dr Mason consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

## Appendix 1: Butcherbird Inferred Resource Estimates (MZM, ASX 7th December 2011)

Classification		Inferred Resource	
Cut-off		10% Mn	
Deposit	Tonnes (Mt)	Mn (%)	
Bindi Bindi Hill	8.75	11.09	
Budgie Hills	1.03	10.82	
Cadgies Flats	0.25	11.08	
Coodamudgi	12.9	11.48	
Illgararie Ridge	17.0	10.71	
Mundawindi	14.2	12.23	
Richies Find	16.1	11.56	
<b>SUBTOTAL</b>	<b>70.2</b>	<b>11.4</b>	
<i>Yanneri Ridge</i>	<i>48.8</i>	<i>11.8</i>	
<b>GLOBAL TOTAL</b>	<b>119.0</b>	<b>11.6</b>	

*Additional Resources estimated with 8% Mn cut for beneficiated product grading under 35% Mn.*

Classification		Inferred Resource	
Cut-off		8-10% Mn	
Deposit	Tonnes (Mt)	Mn (%)	
Bindi Bindi Hill	5.7	9.2	
Budgie Hills	3.5	8.9	
Cadgies Flats	0.2	9.1	
Coodamudgi	3.6	9.5	
Illgararie Ridge	18.5	9.2	
Mundawindi	2.1	9.4	
Richies Find	6.6	9.4	
<b>SUBTOTAL</b>	<b>40.1</b>	<b>9.3</b>	
<i>Yanneri Ridge*</i>	<i>15.8</i>	<i>9.4</i>	
<b>GLOBAL TOTAL</b>	<b>55.9</b>	<b>9.3</b>	

*Note: Resource estimate was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC 2012 on the basis that the resource estimate has not materially changed since it was last reported by independent consultants Snowden Mining Industry Consultants announced by Montezuma Mining Company in ASX release 7<sup>th</sup> December 2011.*

## Appendix 2: Tenements and Locations

Montezuma Mining Company Limited

ASX Additional Information for Quarterly Report to 30 June 2014

	Tenement reference	Location	Interest at beginning of quarter	Acquired / Disposed	Interest at end of quarter
The mining tenements held at the end of the quarter and their location	E52/2350	Butcher Bird WA	100%	N/A	100%
	E36/833	Leinster	100%	N/A	100%
	E52/1529	Mt Padbury WA	100% (Note 1)	N/A	100% (Note 1)
	E70/4465	Jubuk WA	100%	N/A	100%
	E38/2889	Malle Hen Point WA	100%	N/A	100%
	E39/1781	Tropicanna WA	100%	N/A	100%
	E28/2302	Green Dam WA	100%	Disposed	0%
	E28/2313	Green Dam WA	100%	N/A	100%
	E28/2327	Green Dam WA	100%	N/A	100%
	E57/928	Currans Find WA	100%	Disposed	0%
	E20/815	Weld Range WA	100%	Disposed	0%
	E52/2647	Little Well South WA	100%	N/A	100%
	E52/2969	Plutonic North WA	100%	N/A	100%
	E52/2831	Millidie Creek WA	100%	N/A	100%
	E51/1622	Telegraph Well WA	100%	N/A	100%
	E52/2759	Horseshoe Lights North WA	100%	Disposed	0%
	E52/2658	Butcherbird South WA	100%	N/A	100%
	E52/2727	Butcherbird East WA	100%	N/A	100%
	E52/2895	Butcherbird West WA	100%	Disposed	0%
	E52/2808	Butcherbird North West WA	100%	N/A	100%
	E52/2951	Butcherbird North WA	100%	N/A	100%
	E52/2953	Butcherbird North WA	100%	N/A	100%
	E20/659	Eelya Hill WA	10%	N/A	10%
	P20/2018	Eelya Hill WA	10%	N/A	10%
	E47/2817	Hamersley Range WA	100%	N/A	100%
	E47/2818	Hamersley Range WA	100%	N/A	100%
	E47/2819	Hamersley Range WA	100%	N/A	100%
	E46/982	Pilbara WA	100%	N/A	100%
	E09/1985	Yalbra WA	15%	N/A	15%
	E37/1176	Leonora WA	100%	N/A	100%
	E52/3082	Mt Padbury WA	0%	Acquired	100%
	E52/3082	Mt Padbury WA	0%	Acquired	100%

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	Tenement reference	Location	Interest at beginning of quarter	Acquired / Disposed	Interest at end of quarter
<b>Beneficial percentage interests held in farm-in or farm-out agreement</b>	E45/2375	Pilgangoora WA	10% (no tin-tantalum-lithium rights)	N/A	10% (no tin-tantalum-lithium rights)

Notes:

- 1) 100% interest held in all minerals other than iron ore and manganese.

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