MONTEZUMA
MINING COMPANY LTD

17 OCTOBER 2017

BUTCHERBIRD MANGANESE PROJECT
UPGRADED MINERAL RESOURCE ESTIMATE

HIGHLIGHTS

- Butcherbird Manganese Project global resource upgraded to JORC 2012 from JORC 2004.
- Global resource including all deposits drilled to date now stands at **180 million tonnes at 10.8% Mn.**
- Includes a **Maiden Indicated Resource** at Yanneri Ridge of **22.4 million tonnes at 12.0% Mn**.
- Indicated Resources at Yanneri Ridge to be the focus of initial scoping studies **on completion of metallurgical flowsheet design** programme being conducted by CSIRO.
- Represents an **2.7% increase in total contained manganese** as against the previous estimate[1].

Montezuma Mining Company Ltd ("Montezuma" or "Company") is pleased to provide further information regarding its completed Mineral Resource Estimate upgradefor the manganese mineralisation at the Company's 100% owned Butcherbird Project as announced on 12 October 2017.

Importantly the conversion of Inferred Resources to the Indicated classification over more densely drilled portions of the Yanneri Ridge deposit will form the basis for commercial studies to commence on completion of the hydrometallurgical flowsheet design work that is currently being undertaken by the CSIRO.

Executive Director Justin Brown commented;

"Upgrading the Butcherbird manganese resource to JORC 2012 and the conversion of parts of Yanneri Ridge from Inferred to Indicated categories adds to our confidence that this is a technically robust mineral desposit with simple geology, low strip ratios and significant potential to underpin the Company's transition from explorer to developer in the medium term."

[1] See Company ASX Release dated 7 December 2011.

ABOUT MONTEZUMA MINING

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

Montezuma has 100% interests in the Butcherbird Manganese Project which hosts Australia's largest onshore manganese deposit, in addition to the Pinnacles Cobalt Project and the Holleton Gold Project, all located in Western Australia.

MARKET DATA

ASX code:	MZM
Share price:	$0.195
Shares on issue:	83.5M
Market capitalisation:	$16.3M
Cash (at 30 June):	~$4.2M
Listed Investments (at 30 June):	~$7.1M

BOARD AND MANAGEMENT

Chairman	Seamus Cornelius
Executive Director	Justin Brown
Non-Executive Director	John Ribbons
Exploration Manager	Dave O'Neill

Company information, ASX announcements, investor presentations, corporate videos and other investor material on the Company's projects can be viewed at www.montezuma.com.au

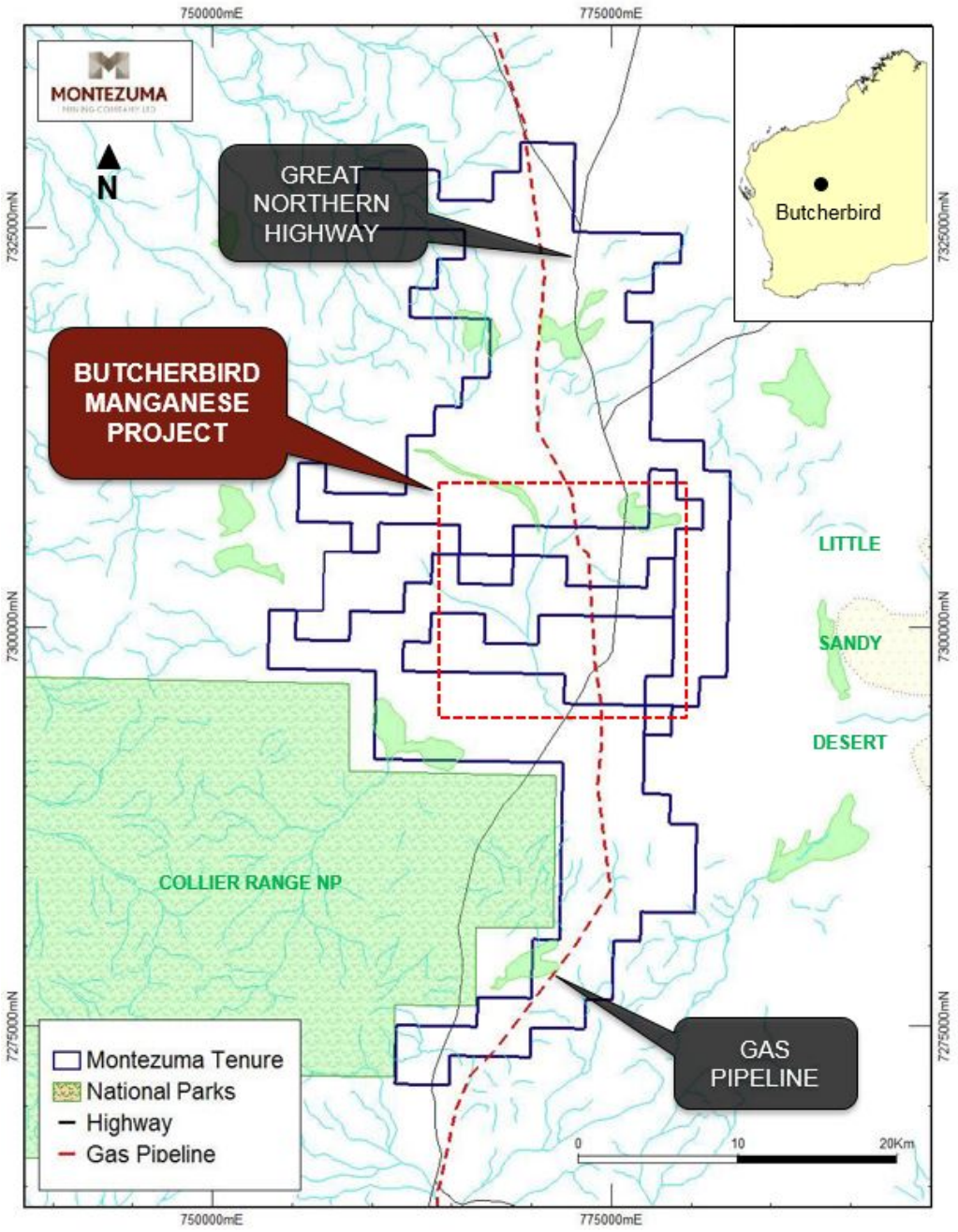

Figure 1: Butcherbird Manganese Project location

REGIONAL GEOLOGY

The Butcherbird Manganese Project is located approximately 120km south of Newman, 40km north of Kumarina Roadhouse, and accessed via the Great Northern Highway. The project is situated on exploration lease E52/2350, and on portions of Bulloo Down and Kumarina Pastoral Leases.

Manganese mineralisation is hosted within the supergene weathered portions of the Ilgarari Formation, which consist of grey/whitish shales (red/brownish weathered), manganiferous shales, mudrocks and minor siltstone layers and dolerite sills. Its stratigraphic thickness is considered to be in excess of 650 metres. The Ilgarari Formation is part of the Collier Subgroup which was deposited on a platform domain in the eastern part of the Bangemall Basin (Bullen Platform).

Prospect	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe (%)	P_2O_5 (%)	Al_2O_3 (%)
Yanneri Ridge						
Inferred	48.0	10.7	43.0	11.1	0.262	10.7
Indicated	22.5	12.0	43.8	11.6	0.297	10.6
Richies Find	22.7	10.9	44.8	11.6	0.24	11.2
Coodamudgi	16.5	11.0	42.9	12.5	0.28	11.0
Mundawindi	16.3	11.9	40.3	11.7	0.30	9.9
Ilgarrarie Ridge	35.6	9.94	46.0	12.5	0.31	11.1
Bindi Bindi Hill	14.4	10.4	45.5	10.1	0.22	11.9
Bugdie Hill	4.50	9.34	45.4	13.2	0.35	11.2
Cadgies Flat	0.291	10.0	46.2	11.1	0.29	12.3
Total	**180.8**	**10.8**	**43.9**	**11.7**	**0.3**	**10.9**

Table 1. Butcherbird Manganese project Mineral Resource Classification

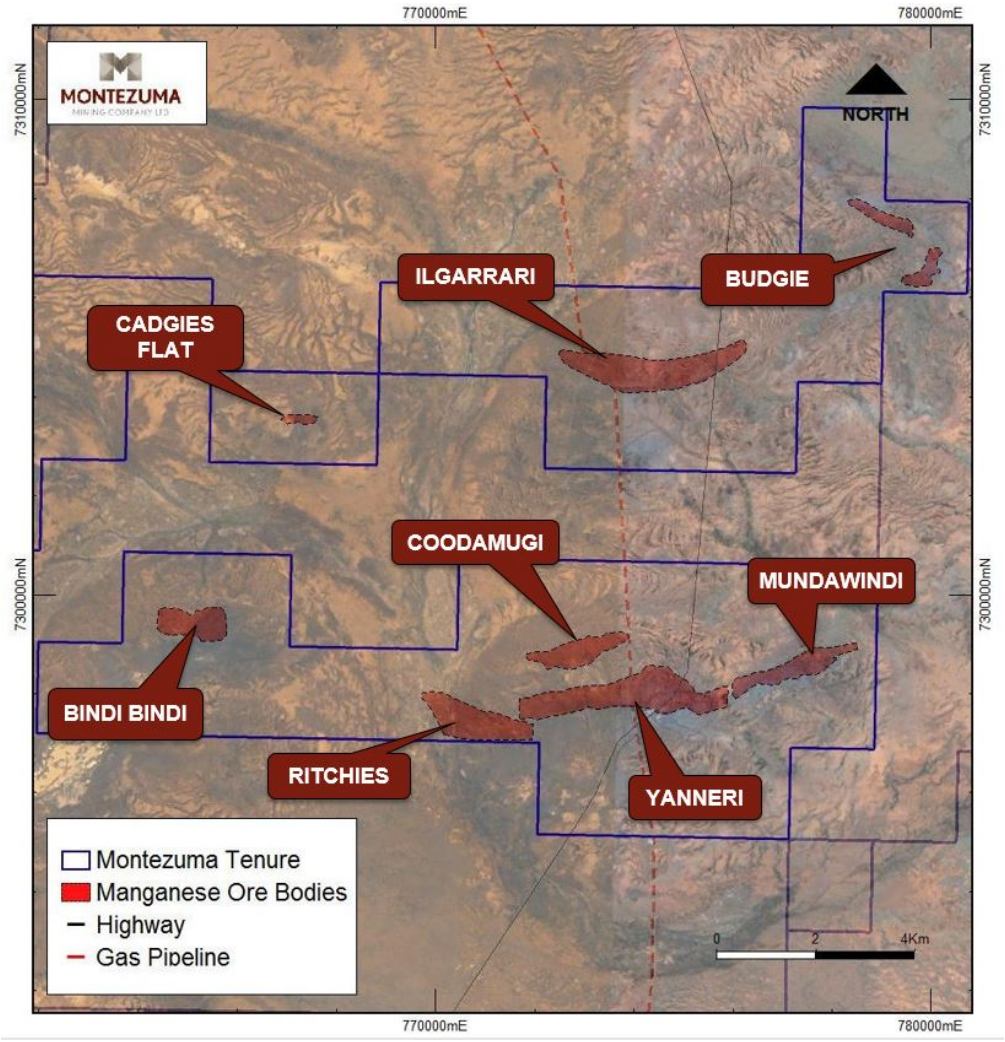

Figure 2: Butcherbird Manganese Project Resource outlines and location

RESOURCE ESTIMATION

The existing Snowden December 2011 JORC 2004 Butcherbird Manganese Deposit Resource was reviewed and re-reported updating the existing resource to JORC 2012 as the resource confidence category. The 2011 Resource reported a total inferred resource of 70.2 Mt @ 11.4 % Mn at a cut off of 10% Mn and 110.3 Mt @ 10.6 % Mn at a cut off of 8 % Mn.

Drill samples used in the resource are from Reverse Circulation (RC) Drilling with Drill-Rig mounted riffle splitters and collected at one-meter intervals. All drilling is vertical with the average depth of 30m. The manganese ore zones are close to flat lying and therefore drillhole intersections approximate true width. All drilling is dry and above the water table. Diamond holes are drilled primarily for metallurgy and have been used to aid interpretation.

All data is captured electronically and has to pass extensive quality assurance and quality control (QAQC) procedures to be used. QAQC processes include validation of hole coordinates, field standards, lab standards, field duplicates. This estimation incorporates all of the validated RC holes drilled at Butcherbird Manganese Deposit by Montezuma from 2010 to 2011. All data is stored in the company's GBIS database, now GEOBANK.

Density has been calculated from down hole gamma gamma geophysical density. Average densities have been applied globally to the model. No account has been made for moisture and reported tonnes are wet tonnes.

The main mineralised units, cut to the regolith boundaries the base of hard capping and the base of oxidisation, were modelled in 3D by Montezuma. These were passed on to Snowden and validated for the resources.

KNA, variography and detailed statistics was performed on the mineralised domains. This KNA and variography was used to determine the block size and estimation parameters for grade modelling.

Block models were constructed for use in grade estimation with block dimensions based on the KNA. Blocks ranged from 10 to 100 metres in x and y, and 2 to 4 metres in z, with sub blocking down to 12.5m by 12.5m by 0.625m x y z.

The deposit was estimated using ordinary kriging ("OK") grade interpolation of 1m composited data within domained boundaries. Grades were estimated for Mn, Fe, SiO_2, Al_2O_3 and P_2O_5.

Interpolation parameters were based on the geometry of geology and geostatistical parameters determined by variography and KNA.

A detailed validation of the block models was completed, which included both visual and statistical reviews. The models are considered to be globally robust.

The resource has been categorised Inferred in accordance with JORC requirements (2012). The resource has been classified as inferred and has been drilled at nominal spacing of 400 x 100 metres, with some areas drilled down to 20 x 40m, and up to 800 x 100m. Good geological and statistical continuity is seen at all drill spacing's.

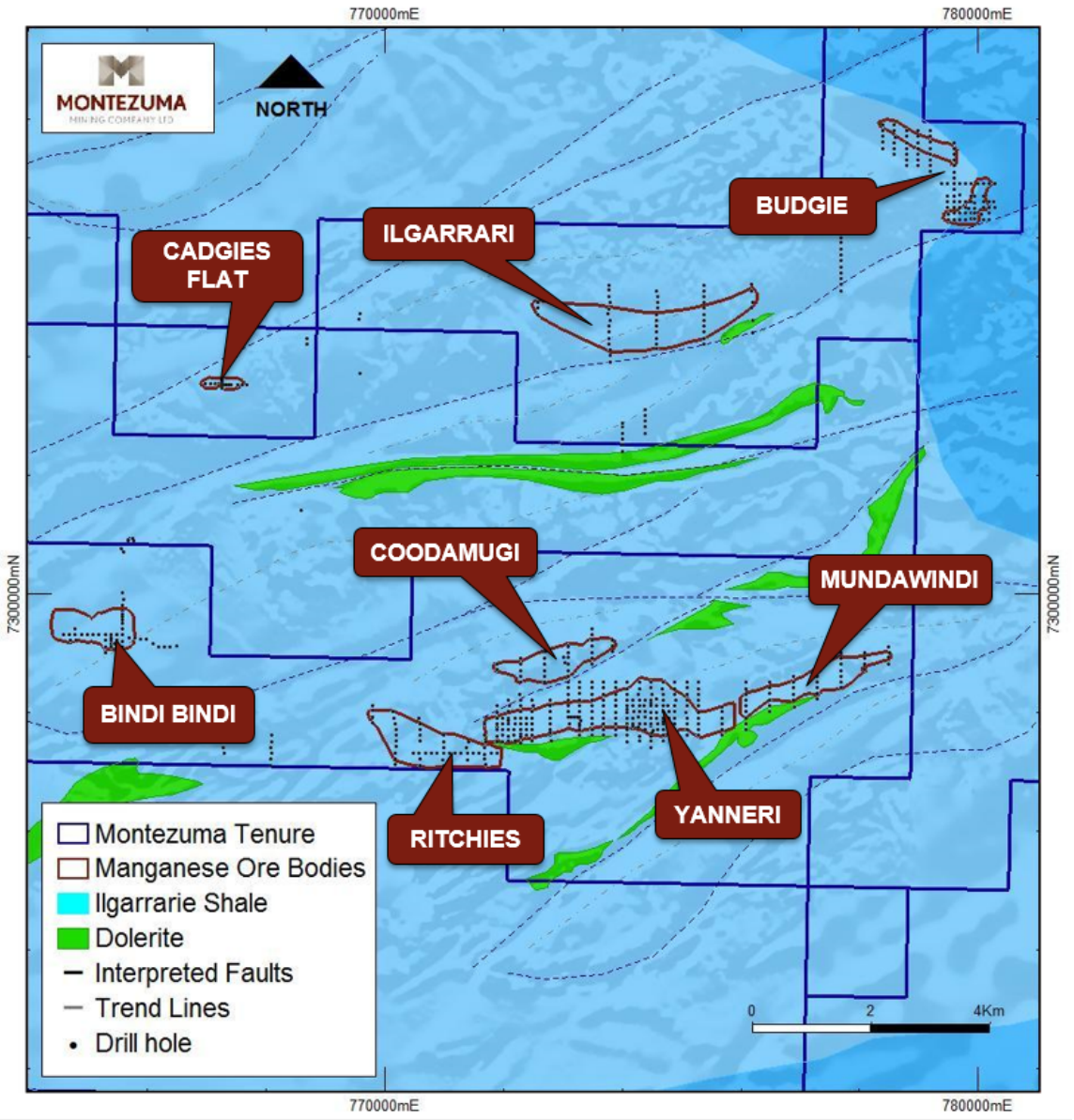

Figure 3: Butcherbird Manganese Project drill collar and Mn orebody outlines overlaying local geology

YANNERI RIDGE RESOURCE ESTIMATION

A new resource estimation has been produced for the Yanneri Ridge Manganese Deposit. This estimation was completed with the intention of updating the existing resource to JORC 2012 as the resource confidence category.

This resource is an update from the 2011 Yanneri Ridge Resource, classified as inferred. The 2011 Resource reported a total resource of 48.8 Mt @ 11.8 % Mn at a cut off of 10% Mn and 64.7 Mt @ 11.2 % Mn at a cut off of 8 % Mn.

Drill samples used in the resource are from Reverse Circulation (RC) Drilling with Drill-Rig mounted riffle splitters and collected at one-meter intervals. All drilling is vertical with the average depth of 30m. The manganese ore zones are close to flat lying and therefore drillhole intersections approximate true width. All drilling is dry and above the water table. Additional Diamond holes are drilled primarily for metallurgy and have been used to aid interpretation.

All data is captured electronically and has to pass extensive quality assurance and quality control (QAQC) procedures to be used. QAQC processes include validation of hole coordinates, field standards, lab standards, field duplicates. This estimation incorporates all of the validated RC holes drilled in the Yanneri Ridge by Montezuma from 2010 to 2011. All data is stored in the company's GBIS database.

Density has been calculated from down hole gamma gamma geophysical density. Average densities by geological unit and mineralisation have been applied globally to the model. No account has been made for moisture and reported tonnes are wet tonnes.

The main mineralised shale unit along with regolith boundaries for the base of hard capping and the base of oxidisation were modelled in 3D using Micromine.

Variography and detailed statistics were performed on the modelled domains. This variography was used to determine the estimation parameters for the grade modelling.

A block model was constructed for use in grade estimation with block dimensions of 50m NS by 50m EW and 2.5m in the vertically with sub blocking 12.5m by 12.5m by 0.625m. The deposit was estimated using ordinary kriging ("OK") grade interpolation of 1m composited data within domained hard boundaries. Grades were estimated are Mn, Fe, SiO_2, Al_2O_3, P_2O_5, MgO, CaO, TiO_2, Na_2O, CaO, S, K_2O, LOI total, Cr_2O_3, Ba, Cu, Pb and Zn.

Interpolation parameters were based on the geometry of geology and geostatistical parameters determined by variography.

A detailed validation of the block model was completed, which included both visual and statistical reviews. The model is considered to be globally robust.

The resource has been categorised as Indicated, and Inferred in accordance with JORC requirements (2012). The portion of the resource drilled at a spacing of 100 x 100 or better displayed good continuity of mineralisation and was classified as indicated. The remaining areas have been classified as inferred and have been drilled at 200 x 100 and at 400 x 100m, showing good geological and statistical continuity.

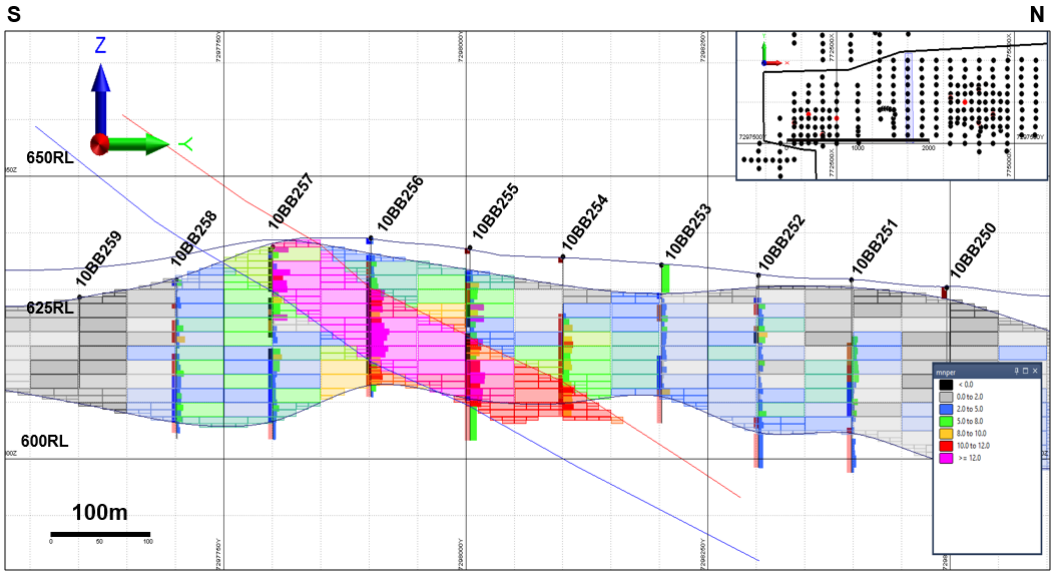

Figure 4: N-S Section through the Yanneri Ridge resource area (773,500E) showing Manganese Resoruce Blocks (Note – vertical exaggeration 5:1)

FOR MORE INFORMATION…

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Email: jbrown@montezuma.com.au Company information, ASX announcements, investor presentations, corporate videos and other investor material on the Company's projects can be viewed at: http://www.montezuma.com.au.

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Mr David O'Neill who is a member of the Australasian Institute of Mining and Metallurgy. At the time that the Exploration Results and Exploration Targets were compiled, Mr O'Neill was an employee of Montezuma Mining Company Ltd. Mr O'Neill is a geologist 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 O'Neill consents to the inclusion of this information in the form and context in which it appears in this report.

The information in this report that relates to Mineral Resources is based on information compiled by Mr Mark Glassock who is a member of the Australasian Institute of Mining and Metallurgy. At the time that the Mineral Resources were compiled, Mr Glassock was a consultant to Montezuma Mining Company Ltd. Mr Glassock is a geologist 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 Glassock consents to the inclusion of this information in the form and context in which it appears in this report

Please note with regard to exploration targets, the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.

JORC Code, 2012 Edition – Table 1 report (Yanneri Ridge)

SECTION 1 SAMPLING TECHNIQUES AND DATA

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*	• Sampling intervals for all RC holes were 1m from the rig mounted splitter. • The samples were split into approximately 2-3kgs into pre-numbered calico bags. The splitter was inspected at the end of each drill rod, and cleaned with compressed air as routine.
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	• Certified Reference Material (CRM) was inserted into the samples on the basis of 1/40. Analysis was by standard XRF technique at Nagrom and SGS Laboratories in Perth Australia. • Standard QA/QC analysis was carried out on the assay data to confirm the validity of both the sampling method and laboratory analysis. In addition, Nagrom and SGS laboratories have internal QA processes which includes both duplicates and standards in the analysis. • An examination of the QAQC sample data indicates satisfactory performance of the duplicate samples and the laboratory has acceptable precision with no bias.
	• *Aspects of the determination of mineralisation that are Material to the Public Report.*	• Samples were dried crushed and pulverised at the Company's sample preparation laboratory to get 90% of the sample <160µm to provide a 150g gram sample which was then assayed via industry standard XRF at Nagrom and SGS Perth.
	• *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. .*	• Additional size fraction analysis was carried out on the trench colluvium samples to assist with the determination of clay fractions and to assist with defining metallurgical characteristics.

Criteria	JORC Code explanation	Commentary
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Drilling was carried out predominantly with RC with a small volume of Diamond Drilling. The RC holes were completed using a 140mm diameter face sampling hammer (10 metallurgical holes were drilled using PQ_3 rods).
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	• RC recoveries were estimated and reported by the supervising geologist. • Measures were taken to maximise sample recovery and ensure representative nature of the samples. Nominal 2-3kg calico bag sample weight was desired feed from rig mounted cyclone and riffle splitter. • Riffles were inspected at the end of each rod, and routinely cleaned with compressed air from rig.
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	• RC drilling was the preferred drill technique in order to maximise sample recoveries. Care was taken in keeping sample dry. ➢
	• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Twin RC/Diamond drill hole data has shown that some bias in grade may exist where sample recoveries are less than 50%, this generally only occurs within the top 10m of the ore-body. Recoveries of diamond core near surface were poor in places and to minimize this effect, trenching was conducted where 100% of the sample could be collected.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	• All diamond drill core and RC chips have been geologically logged by suitably qualified geological staff. Lithologies, colour, texture, alteration, texture, RQD, structural density and magnetic susceptibility were recorded to add to the MRE interpretation and metallurgy.
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* •	• Logging is qualitative in nature, with the exception of density and magnetic susceptibility.
	• *The total length and percentage of the relevant intersections logged.*	• Every RC Sample has been geologically logged on nominal 1m intervals.
Sub-sampling techniques	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	• Where PQ_3 Diamond Drilling has been used, 100% of the core was used for assaying and metallurgical purposes.

Criteria	JORC Code explanation	Commentary
and sample preparation		
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	• The majority of RC samples were sampled dry via a riffle splitter. • All Diamond Core samples were dried prior to sampling.
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	• Sample preparation for all samples was carried out by Nagrom and SGS Laboratories (accredited). • XRF sample material is dried in an oven at 105 degrees Celsius. A sample disk is produced using 0.8000 grams of dried sample with 8.000 grams of 12:22 lithium tetra borate and metaborate flux containing 5% lithium nitrate. The flux and sample are mixed and heated to 1000 degrees Celsius in a platinum crucible for 15 minutes. The resulting borate-glass melt is poured into a platinum mold to form a fusion disk. The disk is then analysed by a Panaytical Axios XRF to determine element concentrations in the sample. • Loss on Ignition (LOI) analysis utilized a dried sample is heated to 1000 degrees Celsius for four hours. The mass loss due to heating is determined using an electronic balance capable of weighing to +/- 0.0001 grams.
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	• Sizing analysis of the laboratories crushing and pulverizing is monitored daily, no issues on the particle sizing has been discovered.
	• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.*	• All RC duplicate samples were re-split for the bulk residue sample. • Analysis of the QA/QC data has shown the primary versus duplicate samples have excellent correlation and no sampling bias has been detected.
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• Samples were collected on nominal 1m intervals within the entire drill hole. • RC samples were split with a final sample size of 2-3kg. These are industry standard and are appropriate for this type of mineralisation.
Quality of assay data and	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	• All samples were analyzed at Nagrom and SGS Laboratories in Perth, Australia using XRF analysis which is an industry standard analysis of manganese ore.

Criteria	JORC Code explanation	Commentary
laboratory tests		• Elements assayed using XRF include Mn, Fe, Al_2O_3, CaO, Cr_2O_3, P_2O_5, SiO_2, Ba, K_2O, MgO, Na_2O, S, TiO_2 LOI, Cu, Pb, Zn.
	• *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*	• Specific Gravity (SG) data was captured using gamma gamma logging at 2cm intervals.
	• *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Quality Assurance was conducted with 1 duplicate sample being collected every 40 samples. The duplicate samples and standard references material were analysed at Nagron and SGS Laboratories using identical methods. • All duplicate samples returned acceptable analysis with samples achieving acceptable correlation with no sample bias. The majority of Standard references (CRM) results returned analysis within 3 standard deviations of the expected grade. • Sample analysis is routinely checked via pulp round robin tests with other certified laboratories. No bias or analytical issues have been detected to date.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel*	• All data has been checked for accuracy by senior MZM and Contractor geological staff.
	• *The use of twinned holes.*	• Twinned Diamond/RC holes have shown no significant bias between the drill techniques where sample recovery is greater than 50%.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	• All data is logged digital into Excel data entry templates. The data entry templates are checked by the Data Manager and input into the companies GBIS sequel geological database. Data is input into temporary database tables where it passes through verification testing, once verified it is input into the database. All assay data is supplied in csv format from the laboratory and input directly into the data base assay tables. A QA/QC package is linked to the database which checks both duplicate and standard assay results to track sampling and analysis accuracy.

Criteria	JORC Code explanation	Commentary
	• *Discuss any adjustment to assay data.*	• No adjustments have been made to assay data returned from the laboratory.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	• All drill holes have been surveyed by Down Under Surveys using an Ashtec DGPS +/- 39cm.
	• *Specification of the grid system used.*	• The license is located entirely within Universal Transverse Mercator Zone 50 South with all co-ordinates recorded using the World Geodetic System 94 datum and UTM Zone 50 projection.
	• *Quality and adequacy of topographic control.*	• The topographic data was captured via an AS350BA Squirrel Helicopter using Opti-Logic RS800 Laser Altimeter and Novatel Superstar II GPS systems.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	• Drilling is nominally on 200m by 100m spacing with variation dependent upon orientation of the ore-body. The drill spacing is within acceptable industry standards for this style of ore body. • The indicated portion of the resource has been drilled at 100 x 100 metres or better.
	• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.*	• The drill spacing is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource.
	• *Whether sample compositing has been applied.*	• No sample compositing has been applied for the purposes of the MRE.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	• 234 RC and 10 diamond drill holes were used in the resource estimate for a total of 6800.4 metres of drilling. All holes were drilled vertically. The averge hole depth is 30 m. The manganese ore zones are close to flat lying and therefore drillhole intersections approximate true width. • The geology and mimeralision is flat lysing dipping between 5 and 7 degress to the north, north east. • The orientation of the drilling is close to a perpendicular orientation to the geology and minerlaistion and is considered unbiased.

Criteria	JORC Code explanation	Commentary
	• *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• No orientation based sampling bias has been identified in the data to date.
Sample security	• *The measures taken to ensure sample security.*	• All sample data was recorded digitally. Samples were packed in numbered polyweaves and send via a courier company to laboratory in Perth with connote.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Snowden visited the site for the 2011 resources and found all aspects of exportation to be satisfactory.

SECTION 2 REPORTING OF EXPLORATION RESULTS

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings*	• The Butcherbird Project consists of a single granted exploration license – E52/2350. • The tenure is 100% owned by Montezuma Mining Corporation Ltd.
	• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• The permit is considered secure.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The historical exploration data has been collected by various parties and has been reported to high standards. • The methods of exploration and techniques used are considered

Criteria	JORC Code explanation	Commentary
		appropriate for the deposit types sought (Mn)
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Butcherbird is a stratiform sedimentary manganese deposit. • The deposits are hosted within the Ilgarari Formation which is generally flat lying with gentle open folding in places. • The manganese mineralisation within the ore zones is divided into three distinctive units – a high grade manganiferous cap, supergene enriched manganiferous laterite and basal shale.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL of the drill hole collar* ○ *dip and azimuth of the hole* ○ *down hole length and interception depth* ○ *hole length.*	• No individual exploration results are listed within this announcement as the announcement covers a MRE (Mineral Resource Estimate).
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	• No information has been excluded.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	• No grade cutting has taken place. The MRE is reported at a Manganese cutoff grades of 8 %.
	• *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*	• No sample length bias was identified. The majority of the samples are 1 metre with some material outside the mineralised areas composited to 4 m via spear.
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No metal equivalents have been used.
Relationship between mineralisation widths and	• *These relationships are particularly important in the reporting of Exploration Results.*	• All grade is reported on a weighted average.

Criteria	JORC Code explanation	Commentary
intercept lengths		
	• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*	• The mineralisation is strata bound and flat lying, striking at 80 degrees and dipping at around 7 degrees to the North (some local variation) and all drilling is shallow vertical, intersecting the mineralisation perpendicular to strike and dip.
	• *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• No individual exploration results are listed within this announcement as the announcement covers a MRE (Mineral Resource Estimate).
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Refer to body of the report.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• The thickness of the modelled minerlaisation 5 m up to 26 m. with a average with of appoximatly 18m. Mn grades within the mineralisation range from 0.4 to 33.3 % Mn with a mean grade of 12.02 % Mn
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• NA
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Future in-fill drilling will be targeted at upgrading the resource classes of the ore body and providing further metallurgical samples. • Metallurgical work is continuing along with discussion around the commercialization of the project.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*	• Data is supplied from site via spreadsheet, this data in input directly into the Company GBIS database where routine validation checks are run. Assay data is received in csv format from the laboratory and merged directly into the Database.
	• *Data validation procedures used.*	• All Data is re-run through a Validation program to define any errors. Data is plotted and validated by geologist as a final measure of validation. QA/QC analysis of all assay data is routinely run to check for any laboratory errors.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• As drilling ceased in 2011 the Competent Person has not carried out a site visit. Diamond core, bulk samples, coarse rejects, chip trays and pulps have been seen the Component person. Satellite imagery confirming the position of the drill hole. Snowden carried out a site trip and observed all aspects of the Exploration Program finding everything satisfactory. All exploration methodologies have been checked for their validity.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	• The geological of the deposits geology and mineralisation controls are relatively simple and the interpretation is grossly correct, infill drilling in some places has assisted with refinements to that interpretation.
	• *Nature of the data used and of any assumptions made.*	• Mineralisation has been identified by using a combination of geology, geochemistry. Stratigraphy and regolith boundaries have been identified from logging and geochemistry, and this has been domained as the favourable mineralised unit.
	• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*	• The stratigraphy has been interpreted as a flatly dipping unit, striking at 80 degrees and dipping at around 7 degrees to the North. This interpretation is robust and confirmed by satellite imagery and surface

Criteria	JORC Code explanation	Commentary
		outcrop. There may be some slight local variation to the interpretation with infill data but these changes would only be minor.
	• *The use of geology in guiding and controlling Mineral Resource estimation.*	• As the mineralisation is strata bound the resource estimate used the geology to domain the resource and control the grade distribution. Regolith boundaries for the hard-cap and base of oxidisation with the Geological boundary were hard grade boundaries. A search ellipse striking at 80 degrees dipping at 7 degrees towards 350 degrees was used in the estimation
	• *The factors affecting continuity both of grade and geology.*	• The continuity of the geology and grade is reasonably well understood but is affected by local variation in folding, faulting and thinning or broadening of bedding is typical with this style of mineralisation. At the base of oxidization there is a spike in Sulphur, crossing lithologies, which would be due to localized gypsum. And would wash out with processing.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The block model extends from 7292750 N to 7298750 E, 771550 E to776100 E and 580 to 650 m in RL. The topography surface is approximately 630 m RL. The model was cut-off at the base of drilling.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*	• The MRE was calculated in Surpac 6.51 using ordinary kriging (OK) as the estimation technique. This is a standard technique used for manganese resource estimations and was used in the maiden resource in January 2011 by Snowden.
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*	• The current resource is an update on the January 2011 resource which was estimated by Snowden according to JORC 2004. All data used in the January 2011 resource has been included in the current resource.
	• *The assumptions made regarding recovery of by-products.*	• No assumptions have been made
	• *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).*	• Mn, Fe, SiO_2, Al_2O_3, P_20_5, LOI, S, MgO, K_2O, CaO, TiO_2, Na_2O, Cr_2O_3, MgO, Cu, Ba, Zn and Pb were all estimated in the resource.
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	• The search geometry was determined from the orientation of the geology and mineralisation. With the first estimation pass having a strike

Criteria	JORC Code explanation	Commentary
		of 120m. the across strike distance was 60m and the down dip distances was 15m. • Ordinary kriging (OK) was used to interpolate the grade with search parameters derived from variography. • A minimum of 5 samples from a minimum of 2 drill holes and maximum of 30 samples was required to estimate a block • For estimation passes two and three, the search ellipses were expanded by a factor of 1.4 and 4.2 respectively.
	• *Any assumptions behind modelling of selective mining units.*	• Na
	• *Any assumptions about correlation between variables.*	• No assumptions were made about the correlation between variables.
	• *Description of how the geological interpretation was used to control the resource estimates.*	• Geological boundaries and domains were treated as hard boundaries and only samples within the geological domains were used to estimate that domain. Interpolation of the orientation was based on the geological units geometry.
	• *Discussion of basis for using or not using grade cutting or capping.*	• Statistical analysis of the all geological domains was performed and model elements. High grade top cuts were applied to elements who's coefficient of variation (CV) was greater than 1.2, top cuts were applied at the change of slope of the frequency histogram. This effected CaO, S, Cu.
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• The resource model was validated against the estimation data visually and statistically. Visual investigations again geology and estimated grade were carried out. Swath plots by north east and RL were used to compare grade of the model to the estimation data.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• No account has been taken for moisture. The tonnages are wet. • There is no current test work to determine the moisture content.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• A cutoff grade of 8% Mn was applied as this reflected the economic cut-off for the metallurgical test work.

Criteria	JORC Code explanation	Commentary
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• The mineralisation is stratabound oxide material around 20 metres in thickness easily ably to be mined with limited stripping. • Coventional truck and shovel mining is evisiaged. Trucked to a centrally located processing facility. • No mining assumptions used in the MRE • No account has been taken for mining dilution in the MRE.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Detailed metallurgical test work has shown the manganese mineralisation is easily upgradable to a low-grade product with a typical scrubbing, wet screening and then two stages of gravity separation. • This low-grade product would, if sold currently, have a discounted sale prices as reflected by the Manganese product grade. • Recent bench top studies have shown this can then be upgraded to a premium saleable product with hydro-metallurgical processing. This test work is continuing.
Environmen-tal factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• Environmental baseline studies for both Terrestrial Fauna and Flora have been completed as part of the Prefeasibility Studies. • No current or potential environmental issues were identified in the studies.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*	• Specific Gravity (SG) data was captured using gamma logging at 2cm intervals. • 9 drill holes were surveyed, with the average density of these being used to determine the deposit average. ➢

Criteria	JORC Code explanation	Commentary
	• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.*	• The gamma gamma logging measures the all in specific gravity and is a wet density. No account has been taken for moisture. • Trenching dug across the orebody provided physical samples of surface material for analysis
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Statistical analysis shows that bulk densities are sensitive to depth with low variability within lithological units. There is no correlation evident with the density and grade. There was insufficient information to calculate a regression curve for the density vs depth so the average density was applied.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.*	• Resource classifications were determined by a combination of OK estimation confidence (determined from the regression slope value), sample search pass number combined with geological confidence and drill hole spacing.
	• *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*	• Appropriate account has been taken of all relevant factors.
	• *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• Yes, these results were what was expected from the knowledge of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• There have been no audits or reviews of this mineral resource. This is an updated resource from the resource estimated by Snowden in January 2011 (JORC 2004) with addition metallurgical data.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*	• The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC code.

Criteria	JORC Code explanation	Commentary
	• *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*	• The statement relates to global estimate of tonnes and grade for an inferred and indicated resource.
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• No production data is available.

JORC Code, 2012 Edition – Table 1 report (Resources outside Yanneri Ridge)

SECTION 1 SAMPLING TECHNIQUES AND DATA

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	*Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*	• Sampling intervals for all RC holes were 1m from the rig mounted splitter. • The samples were split into approximately 2-3kgs into pre-numbered calico bags. The splitter was inspected at the end of each drill rod, and cleaned with compressed air as routine. • Some samples were composited to 4 m in areas away from the mineralization. This was done with the use of a sample spear.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	• Certified Reference Material (CRM) was inserted into the samples on the basis of 1/40. Analysis was by standard XRF technique at Nagrom and SGS Laboratories in Perth Australia. • Standard QA/QC analysis was carried out on the assay data to confirm the validity of both the sampling method and laboratory analysis. In addition, Nagrom and SGS laboratories have internal QA processes which includes both duplicates and standards in the analysis.

Criteria	JORC Code explanation	Commentary
		• An examination of the QAQC sample data indicates satisfactory performance of the duplicate samples and the laboratory has acceptable precision with no bias.
	Aspects of the determination of mineralisation that are Material to the Public Report.	• Samples were dried crushed and pulverised at the Company's sample preparation laboratory to get 90% of the sample <160µm to provide a 150g gram sample which was then assayed via industry standard XRF at Nagrom and SGS Perth.
	In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• Additional size fraction analysis was carried out on the trench colluvium samples to assist with the determination of clay fractions and to assist with defining metallurgical characteristics.
Drilling techniques	*Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Drilling was carried out predominantly with RC with a small volume of Diamond Drilling. The RC holes were completed using a 140mm diameter face sampling hammer (10 metallurgical holes were drilled using PQ_3 rods).
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	• RC recoveries were estimated and reported by the supervising geologist. • Measures were taken to maximise sample recovery and ensure representative nature of the samples. Nominal 2-3kg calico bag sample weight was desired feed from rig mounted cyclone and riffle splitter. • Riffles were inspected at the end of each rod, and routinely cleaned with compressed air from rig.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	• RC drilling was the preferred drill technique in order to maximise sample recoveries. Care was taken in keeping sample dry.
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Twin RC/Diamond drill hole data has shown that some bias in grade may exist where sample recoveries are less than 50%, this generally only occurs within the top 10m of the ore-body.

Criteria	JORC Code explanation	Commentary
		• Recoveries of diamond core near surface were poor in places and to minimize this effect, trenching was conducted where 100% of the sample could be collected.
Logging	*Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	• All diamond drill core and RC chips have been geologically logged by suitably qualified geological staff. • Lithologies, colour, texture, alteration, texture, RQD, structural density and magnetic susceptibility were recorded to add to the MRE interpretation and metallurgy.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	• Logging is qualitative in nature, with the exception of density and magnetic susceptibility.
	The total length and percentage of the relevant intersections logged.	• Every RC Sample has been geologically logged on nominal 1m intervals.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	• Where PQ_3 Diamond Drilling has been used, 100% of the core was used for assaying and metallurgical purposes.
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	• The majority of RC samples were sampled dry via a riffle splitter. • All Diamond Core samples were dried prior to sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	• Sample preparation for all samples was carried out by Nagrom and SGS Laboratories (accredited). • XRF sample material is dried in an oven at 105 degrees Celsius. A sample disk is produced using 8.000 grams of dried sample with 8.000 grams of 12:22 lithium tetra borate and metaborate flux containing 5% lithium nitrate. The flux and sample are mixed and heated to 1000 degrees Celsius in a platinum crucible for 15 minutes. The resulting borate-glass melt is poured into a platinum mold to form a fusion disk. The disk is then analysed by a Panaytical Axios XRF to determine element concentrations in the sample.

Criteria	JORC Code explanation	Commentary
		• Loss on Ignition (LOI) analysis utilized a dried sample is heated to 1000 degrees Celsius for four hours. The mass loss due to heating is determined using an electronic balance capable of weighing to +/- 0.0001 grams.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	• Sizing analysis of the laboratories crushing and pulverizing is monitored daily, no issues on the particle sizing has been discovered.
	Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.	• All RC duplicate samples were re-split for the bulk residue sample. • Analysis of the QA/QC data has shown the primary versus duplicate samples have excellent correlation and no sampling bias has been detected.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	• Samples were collected on nominal 1m intervals within the entire drill hole. • RC samples were split with a final sample size of 2-3kg. These are industry standard and are appropriate for this type of mineralisation.
Quality of assay data and laboratory tests	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	• All samples were analyzed at Nagrom and SGS Laboratories in Perth, Australia using XRF analysis which is an industry standard analysis of manganese ore. • Elements assayed using XRF include Mn, Fe, Al_2O_3, CaO, Cr_2O_3, P_2O_5, SiO_2, Ba, K_2O, MgO, Na_2O, S, TiO_2 LOI, Cu, Pb, Zn.
	For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	• Specific Gravity (SG) data was captured using gamma gamma downhole logging at 2cm intervals.
	Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	• Quality Assurance was conducted with 1 duplicate sample being collected every 40 samples. The duplicate samples and standard references material were analysed at Nagron and SGS Laboratories using identical methods. • All duplicate samples returned acceptable analysis with samples achieving acceptable correlation with no sample bias. The majority of Standard references (CRM) results returned analysis within 3 standard deviations of the expected grade.

Criteria	JORC Code explanation	Commentary
		• Sample analysis is routinely checked via pulp round robin tests with other certified laboratories. No bias or analytical issues have been detected to date.
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel*	• All data has been checked for accuracy by senior MZM and Contractor geological staff.
	The use of twinned holes.	• Twinned Diamond/RC holes have shown no significant bias between the drill techniques where sample recovery is greater than 50%.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	• All data is logged digital into Excel data entry templates. The data entry templates are checked by the Data Manager and input into the companies GBIS sequel geological database. Data is input into temporary database tables where it passes through verification testing, once verified it is input into the database. All assay data is supplied in csv format from the laboratory and input directly into the data base assay tables. A QA/QC package is linked to the database which checks both duplicate and standard assay results to track sampling and analysis accuracy.
	Discuss any adjustment to assay data.	• No adjustments have been made to assay data returned from the laboratory.
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	• All drill holes have been surveyed by Down Under Surveys using an Ashtec DGPS.
	Specification of the grid system used.	• The license is located entirely within Universal Transverse Mercator Zone 50 South with all co-ordinates recorded using the World Geodetic System 94 datum and UTM Zone 50 projection.
	Quality and adequacy of topographic control.	• All drill holes were surveyed with a DGPS. This data was used to create topography surfaces for the resource.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	**Richies Find, Coodamudgi and Munawindi** – 400 m by 100 m. **Ilgarrarie Ridge** – 800 m by 100 m **Budgie Hill** – 100 m by 200 m in the north and 100 x 100 m in the south **Bindi Bindi Hill** – 100 m by 100 m in two drill lines (parallel and perpendicular to the strike). Some infill drilling down to 50 m by 50 m spacing around where the drill lines cross. **Cadgies Flat** – 20 m by 40 m in two drill lines (parallel and perpendicular to the strike).
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	• The drill spacing is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource.
	Whether sample compositing has been applied.	• No sample compositing has been applied for the purposes of the MRE. Sample that were composited to 4 metres were in areas away from the mineralisation. These samples were composites to 1 m for the resource estimate.
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	• 636 RC and 10 diamond drill holes were used in the resource estimate for a total of 19,353.2 metres of drilling. 629 of these holes were drilled vertically. The averge hole depth is 30 m. The manganese ore zones are close to flat lying and therefore drillhole intersections approximate true width. • The geology and mimeralision is flat lying dipping between 5 and 7 degress to the north, north east. • The orientation of of the drilling is close to a perpendicular orientation to the geology and minerlaistion and is considered unbiased.
	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• No orientation based sampling bias has been identified in the data to date.

Criteria	JORC Code explanation	Commentary
Sample security	*The measures taken to ensure sample security.*	• All sample data was recorded digitally. Samples were packed in numbered polyweaves and send via courier company to laboratory in Perth with connote.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	• Snowden visited the site for the 2011 resources and found all aspects of exploration to be satisfactory.

SECTION 2 REPORTING OF EXPLORATION RESULTS

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings*	• The Butcherbird Project consists of a single granted exploration license – E52/2350. • The tenure is 100% owned by Montezuma Mining Corporation Ltd.
	The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The permit is considered secure.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	• The historical exploration data has been collected by various parties and has been reported to high standards. • The methods of exploration and techniques used are considered appropriate for the deposit types sought (Mn)
Geology	*Deposit type, geological setting and style of mineralisation.*	• Butcherbird is a stratiform sedimentary manganese deposit. • The deposits are hosted within the Ilgarari Formation which is generally flat lying with gentle open folding in places. • The manganese mineralisation within the ore zones is divided into three distinctive units – a high grade manganiferous cap, supergene

Criteria	JORC Code explanation	Commentary
		enriched manganiferous laterite and basal shale.
Drill hole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* *easting and northing of the drill hole collar* *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* *dip and azimuth of the hole* *down hole length and interception depth* *hole length.*	• No individual exploration results are listed within this announcement as the announcement covers a MRE (Mineral Resource Estimate).
	If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• No information has been excluded.
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	• No grade cutting has taken place. The MRE is reported at a Manganese cutoff grades of 8 %.
	Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.	• No sample length bias was identified. The majority of the samples are 1 meter with some material outside the mineralised areas composited to 4 m via spear.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	• No metal equivalents have been used.
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	• All grade is reported on a weighted average.

Criteria	JORC Code explanation	Commentary
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	• The mineralisation is strata bound and flat lying dipping at around 5 degrees to the North (some local variation) and all drilling is shallow vertical, intersecting the mineralisation perpendicular to strike and dip.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	• No individual exploration results are listed within this announcement as the announcement covers a MRE (Mineral Resource Estimate).
Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Refer to body of the report.
Balanced reporting	*Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	**Richies Find** - The thickness of the modelled lodes range from 1 m up to 15 m. with a average with of appoximatly 8.5m. Mn grades within these mineralised lodes range from 0.22 to 23 % Mn with a mean grade of 10.9 % Mn **Coodamudgi** – The thickness of the modelled lodes range from 2 m up to 18 m. with a average with of appoximatly 11m . Mn grades within these mineralised lodes range from 2.5 to 28.6 % Mn with a mean grade of 11.1 % Mn **Munawindi** – The thickness of the modelled lodes range from 1 m up to 22 m. with a average with of appoximatly 11m. Mn grades within these mineralised lodes range from 1 to 33 % Mn with a mean grade of 12.04 % Mn **Ilgarrarie Ridge** – The thickness of the modelled lodes range from 1 m up to 21 m. with a average with of appoximatly 10m. Mn grades within these mineralised lodes range from 0.4 to 25.1 % Mn with a mean grade of 10.4 % Mn **Budgie Hill** - The thickness of the modelled lodes range from 1 m up to 12 m. with a average with of appoximatly 5m. Mn grades within these mineralised lodes range from 0.2 to 17.5 % Mn with a mean grade of 9.0 % Mn

Criteria	JORC Code explanation	Commentary
		Bindi Bindi Hill –The thickness of the modelled lodes range from 4 m up to 21 m. with a average with of appoximatly 11.8 m. Mn grades within these mineralised lodes range from 1.5 to 24.6 % Mn with a mean grade of 10.8 % Mn **Cadgies Flat –** The thickness of the modelled lodes range from 1 m up to 9 m. with a average with of appoximatly 5m. Mn grades within these mineralised lodes range from 0.2 to 18.5 % Mn with a mean grade of 9.6 % Mn
Other substantive exploration data	*Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• NA
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Future in-fill and step out drilling will be targeted at upgrading the resource and classes of the ore body. • Metallurgical work is continuing along with discussions around commercialising the project.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	*Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*	• Data is supplied from site via spreadsheet, this data in input directly into the Company GBIS database where routine validation checks are run. Assay data is received in csv format from the laboratory and merged directly into the Database
	Data validation procedures used.	• All Data is re-run through a Validation program to define any errors. Data is plotted and validated by geologist as a final measure of validation. QA/QC analysis of all assay data is routinely run to check for any laboratory errors.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* *If no site visits have been undertaken indicate why this is the case.*	• As drilling ceased in 2011 this Competent Person has not carried out a site visit. Diamond core, bulk samples, coarse rejects, chip trays and pulps have been seen the Component person. Satellite imagery confirming the position of the drill hole. Snowden personal carried out a site trip and observed all aspects of the Exploration Program finding everything satisfactory. All exploration methodologies have been checked for their validity.
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	• The geological of the deposits geology and mineralisation controls are relatively simple and the interpretation is grossly correct, infill drilling in some places has assisted with refinements to that interpretation.
	Nature of the data used and of any assumptions made.	• Mineralisation has been identified by using a combination of geology and geochemistry. Stratigraphy and Regolith boundaries has been identified from logging and geochemistry and these have been domained as the favourable mineralised unit.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	• The stratigraphy has been interpreted as a flatly dipping unit, dipping to the striking East West and dipping at around 5 degrees to the North, with some local variation. This interpretation is robust and confirmed by satellite imagery and surface outcrop. There may be some slight local

Criteria	JORC Code explanation	Commentary
		variation to the interpretation with infill data but these changes would only be minor.
	The use of geology in guiding and controlling Mineral Resource estimation.	• As the mineralisation is strata bound, the resource estimate used the geology to domain the resource and control the grade distribution. Geological boundary were hard grade boundaries. Search ellipses were determined by the strike of the geology and the results of the variography.
	The factors affecting continuity both of grade and geology.	• The continuity of the geology and grade is reasonably well understood but is affected by local variation in folding, faulting and thinning or broadening of bedding is typical with this style of mineralisation. At the base of oxidization there is a spike in Sulphur, crossing lithologies, which would be due to localized gypsum. And would wash out with processing.
Dimensions	*The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	**Richies Find** - The area of mineralisation occurs within a series of lodes which extend over a 2.3 km strike length and average approximately 550 m in width. This area is extended to a known depth of around 9m from surface. The thickness of the individual zones ranges from less than 1 m up to 15 m. **Coodamudgi** – The mineralisation extends over a 1.3km strike length and average approximately 600 m in width. Mineralisation extends from 5m below the surface to a depth of 25 m. The thickness of the individual zones ranges from 2 m up to 25 m. **Munawindi** - The area of mineralisation occurs within a series of lodes which extend over a strike length of 2.7 km and a width of 550 m. This area is extended to a known depth of around 33 m from surface. The thickness of the individual zones ranges from 1 m up to 22 m. **Ilgarrarie Ridge** – Mineralisation occurs within a series of lodes which extend over a 3.7 km strike length and average approximately 600 m in width. Mineralisation starts approximately 8m below the surface and extends down to a depth of around 28 m from surface. The thickness of the individual zones ranges from less than 1 m up to 15 m. **Budgie Hill** - The area of mineralisation occurs within a series of lodes which extend over a 1.3km strike length and average approximately 260

Criteria	JORC Code explanation	Commentary
		m in width. This area is extended to a known depth of around 32 m from surface. The thickness of the individual zones ranges from 1 m up to 12 m. **Bindi Bindi Hill** - The area of mineralisation occurs within a series of lodes which extend over a 1.3km strike length and average approximately 1.3km in width. This area is extended to a known depth of around 40 m from surface. The thickness of the individual zones ranges from 1 m up to 15 m. **Cadgies Flat -** Mineralisation occurs within a series of lodes which extend over a 740m strike length and average approximately 170m in width. This area is extended to a known depth of around 11m from surface. The thickness of the individual zones ranges from 1m up to 9m.
Estimation and modelling techniques	*The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*	• The MRE was calculated in Surpac 6.5 using ordinary kriging (OK) as the estimation technique. This is a standard technique used for this type of manganese resource in estimations.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	• This is an update of the current resource which was estimated by Snowden according to JORC 2004.
	The assumptions made regarding recovery of by-products.	• No assumptions have been made
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	• Grades for Mn, Fe, Al_2O_3, SiO_2, and P_2O_5 were estimated using ordinary block kriging into parent cells.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	• The search geometry was determined from the orientation of the geology and mineralisation. With the first estimation pass having the range determined by variography. • Ordinary kriging (OK) was used to interpolate the grade with search parameters derived from variography. • For estimation pass two, the minimum number of samples was cut by half, The third pass extending the range to double the variography with a minimum of one sample to fill the remaining block.

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	Any assumptions behind modelling of selective mining units.	• NA
	Any assumptions about correlation between variables.	• No assumptions were made about the correlation between variables.
	Description of how the geological interpretation was used to control the resource estimates.	• Geological boundaries and domains were treated as hard boundaries and only samples within the geological domains were used to estimate that domain. • Interpolation of the orientation was based on the geological units geometry and variography.
	Discussion of basis for using or not using grade cutting or capping.	• Statistical analysis of the all geological domains was performed and model elements. High grade top cuts were applied to elements who's coefficient of variation (CV) was greater than 1.2, top cuts were applied at the change of slope of the frequency histogram. This did not affect the estimated elements.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	• The resource model was validated against the estimation data visually and statistically. Visual investigations against geology and estimated grade were carried out. Swath plots by north east and RL were used to compare grade of the model to the estimation data.
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• No account has been taken for moisture. The tonnages are wet. There is no current test work on the moisture content.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	• Resource estimate reported at a grade ≥8 % Mn. A grade cut-off grade of 8% Mn was applied as this reflected the economic cut-off from the metallurgical test work.
Mining factors or assumptions	*Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• The mineralisation is stratabound oxide material around 5 to 20 metres in thickness easily ably to be mined with limited stripping. • Coventional truck and shovel mining is evisiaged. Trucked to a centrally located processing facility. • No mining assumptions used in the MRE • No account has been taken for mining dilution in the MRE.

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Metallurgical factors or assumptions	*The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Detailed metallurgical test work has shown the manganese mineralisation is easily upgradable to a low-grade product with typical scrubbing, wet screening and two staged gravity separation. • This low-grade product would, if sold currently, have a discounted sale prices as reflected by the Manganese product grade. • Recent bench top studies have shown this can then be upgraded to a premium saleable product with hydro-metallurgical processing. This test work is continuing,
Environmen-tal factors or assumptions	*Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• Environmental baseline studies for both Terrestrial Fauna and Flora have been completed as part of the initial scoping studies. • No current or potential environmental issues were identified in the studies.
Bulk density	*Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*	• Specific Gravity (SG) data was captured using gamma gamma logging at 2cm intervals. • 9 drill holes were surveyed, with the average density of these being used to determine the deposit average.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.	• The gamma gamma logging measures the total specific gravity and is the wet density. No account has been taken for moisture. • Trenching across the orebody provided physical samples for analyses.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	• Statistical analysis shows that bulk densities are sensitive to depth with low variability within lithological units. There is no correlation evident with the density and grade. There was insufficient information to calculate a regression curve for the density vs depth so the average density was applied.
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.*	• The estimates have been classified as Inferred Mineral Resources based on geological confidence, the integrity of the data, the spatial continuity

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		of the mineralisation as demonstrated by variography, and the quality of the estimation.
	Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	• Appropriate account has been taken of all relevant factors.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	• Yes, these results were what was expected from the knowledge of the deposit.
Audits or reviews	*The results of any audits or reviews of Mineral Resource estimates.*	• There have been no audits or reviews of the mineral resource. This is a review of the existing resources estimated by Snowden in December reclassifying the JORC 2004 resource as JORC 2012
Discussion of relative accuracy/ confidence	*Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*	• The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC code. Appropriated techniques and checks have taken place to reclassify the resource as JORC 2012.
	The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.	• The statement relates to global estimate of tonnes and grade for an inferred resource.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	• No production data is available.