BLACK CANYON

ASX Announcement

24 October 2023 ASX:BCA

Battery Grade Manganese Sulphate >99% Purity Achieved

- Hydrometallurgical testwork completed on manganese oxide samples from KR1 within the Balfour Manganese Field has generated High Purity Manganese Sulphate Monohydrate (HPMSM) **meeting battery grade specification of > 99% HPMSM Purity** and within specification impurities levels.
- KR1 leach test yielded a 97% extraction rate and through phased purification produced a > **32% Mn content HPMSM** exceeding minimum specification.
- The KR1 sample was collected from 100% owned tenure within the Balfour Manganese Field as part of a broader variability study to assess the amenability of multiple manganese oxide sources to simple beneficiation, leaching and production of battery grade HPMSM.
- Recent drilling at KR1 demonstrated a large, mineralised footprint over 2,000m long with multiple shallow manganese drill intersects[1]. The Company has commenced Mineral Resource Estimation studies on the prospect.
- The downstream production of HPMSM is a key growth opportunity driven primarily by increased utilisation of manganese in EV batteries to reduce cell cost, increase energy density, improve safety performance and recyclability across LFMP, high manganese and sodium-based platforms.
- A significant program of upscaled hydrometallurgical testwork is planned to commence before the end of the quarter to refine flowsheet development and produce larger quantity of HPMSM product.

Australian manganese explorer, Black Canyon Limited (**Black Canyon** or **the Company**) (ASX:BCA), is pleased to announce HPMSM testwork has yielded high manganese extraction rates and has now delivered battery grade HPMSM from the recently drilled KR1 Target.

Black Canyon Executive Director, Brendan Cummins, said:

"Producing Battery Grade HPMSM is a milestone achievement for Black Canyon and shareholders. The HPMSM strategy is strongly supported by the evolution of Li-ion batteries and specifically cathode chemistries with battery technology developers increasing safety and energy density from more readily available materials, which includes higher manganese content across a growing range of battery platforms.

[1] BCA Announcement 23 August 2023 – Drill Results Confirm Manganese Discovery at KR1

"The testwork confirms manganese oxide materials from the KR1 prospect, located within the Balfour Manganese Field, can produce high purity and in specification HPMSM. The Company will continue to deliver key milestones to attract the next level of interest in our projects, which is to establish large mineral resources, evaluate hydrometallurgical variability, substantially progress the battery grade HPMSM flowsheet development, and now commence upscaled testwork for flowsheet robustness and understanding the carbon footprint.

"The Company has a clear mineral resource growth trajectory by defining substantial sources of manganese in the geopolitically stable jurisdiction of Western Australia. In parallel, we are assessing HPMSM plant locations, recognising growing gigafactory capacity across Europe, North America and southeast Asia. The site selection process is complex with many factors to consider. As part of the Scoping Study, we are initially examining Australian locations that could provide a base case solution for a HPMSM facility. We are also excited by the prospect of engaging with the right local and international partners to enhance and complement the workstreams and IP we are developing."

HPMSM Hydrometallurgical Testwork

Black Canyon has successfully completed feedstock variability studies to ascertain the amenability to simple beneficiation and reductive acid leaching from sample material from KR1, Damsite, Pickering, Hurricane and Balfour East.

Following a successful leaching phase, the data was reviewed and the KR1 sample was selected for multistage precipitation/purification, followed by chemical extraction to concentrate the manganese in solution prior to crystallisation to generate HPMSM. [2]

Significant HPMSM testwork outcomes include:

- Manganese enriched shale ores from the Companies 100% owned tenements can be upgraded with simple beneficiation and will likely be further upgraded through the application of DMS.
- Demonstrated that direct reductive acid leach methodology is suitable to extract manganese from manganese oxide ores as opposed to conventional low temperature roasting commonly utilised in China.
- Reductive acid leach recovery extraction rates ranged from 86% up to 99%, with KR1 yielding an extraction rate of 97%, demonstrating high efficiency from the chemical reaction.
- Multistage purification/precipitation utilising widely used industry technology can successfully produce HPMSM.
- Impurity levels within specification as benchmarked against FastMarkets HPMSM domestic Chinese specifications (MB-MN-0008 – refer to Appendix 2)) where greater than 95% of global HPMSM supply is currently produced.
- Battery Grade HPMSM with > 32% Mn and > 99% purity from the KR1 prospect exceeds minimum specifications of 32% Mn.

[2] BCA Announcement 5 September 2023 – Advancing Battery Grade HPMSM Development

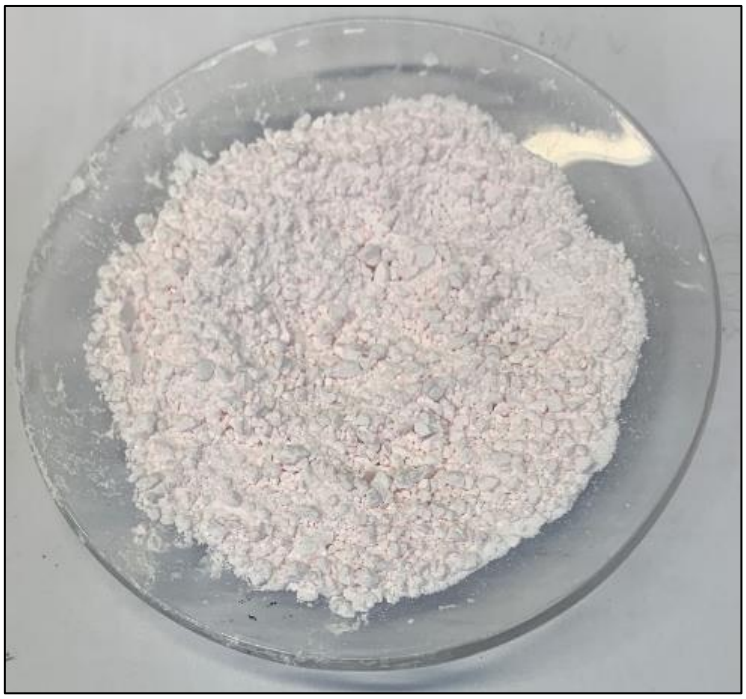

Figure 1. Battery Grade HPMSM crystal produced from the KR1 Prospect.

Future HPMSM Testwork

In order to advance flowsheet design, the next stage of hydrometallurgical testwork is currently being scoped to utilise up to 400kg of material from the recently drilled KR1 and KR2 prospects. It is anticipated that the current manganese oxide ore - HPMSM multistage experimental flowsheet will largely be replicated but on a larger scale allowing optimisation, more detailed review and troubleshooting to further understand each purification/precipitation phase and also deliver more crystal product.

The planned testwork will primarily continue to de-risk the process design, understand physical and chemical reaction kinetics and reagent consumption, optimise test conditions and examine waste products. The information will be of a standard to incorporate into more advanced feasibility studies and assist with the establishment of a pilot testwork program.

HPMSM Strategy Rationale

Whilst manganese is primarily used in the steelmaking industry, a significant growth market continues in the electric vehicle (**EV**) sector. In an increasing number of EV battery compositions, manganese is used in the cathode and makes up a high proportion of the battery volume. The introduction of manganese into LFP batteries, high manganese iron-nickel and high lithium manganese compositions will likely see further demand for HPMSM in addition to NMC chemistries.

In August 2023, Benchmark Minerals HPMSM research predict eight times multiple in terms of manganese demand from cathodes between 2020 and 2030 as battery and automotive manufacturers seek lower cost structures and improve performance, which can be achieved with increased manganese content. [3]

[3] https://source.benchmarkminerals.com/article/benchmark-launches-manganese-sulphate-market-outlook

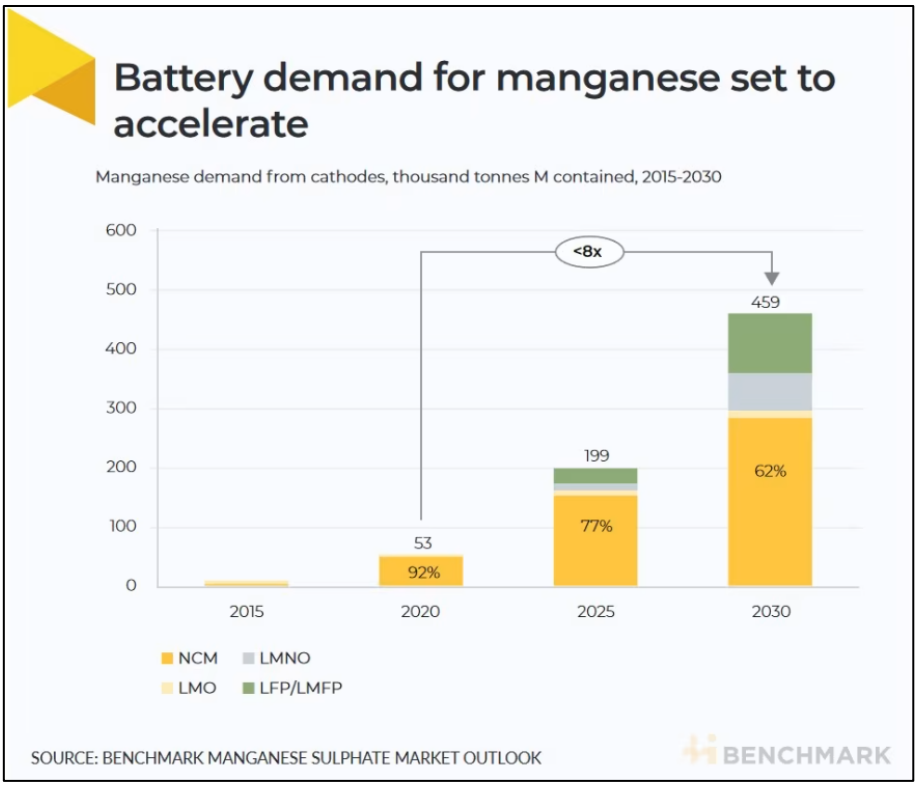

Figure 2. Projected manganese demand from cathodes to 2030. [4]

Currently, China dominates the HPMSM market, with over 90% of global production. Similar to other cathode precursor materials, the requirement for security and diversification of supply will become a material factor inducing the establishment of additional supply outside of China, primarily for the American and European car manufacturing industries.

The US Government has a critical mineral list that the Biden Administration identified as critical for domestic energy, electronics and defence that includes manganese. The Inflation Reduction Act approved by the US Government and the Free Trade Agreement between the US and Australia enables direct US investment into Australian critical mineral projects and will substantially incentivise electric vehicle and clean energy industries to establish operations in the US. This has continued to positively impact US and European investment in the development of new cathode or battery pack production capacity in parallel with joint ventures between automakers and battery manufacturers to meet growing EV demand.

The potential benefit to Black Canyon is the expansion of the manganese sulphate market beyond China and an interest from car and battery manufacturers in gaining access to long term physical supplies of manganese from a Tier 1 location like Australia.

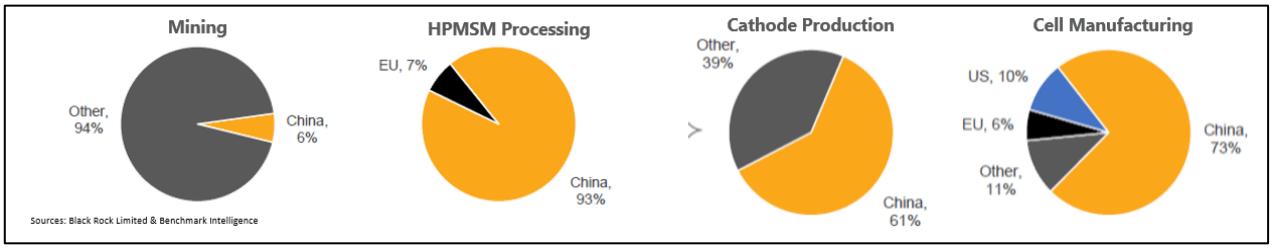

Figure 3. Current supply chain for HPMSM-cathode and cell production dominated by China

[4] https://source.benchmarkminerals.com/article/benchmark-launches-manganese-sulphate-market-outlook

This announcement has been approved by the Board of Black Canyon Limited.

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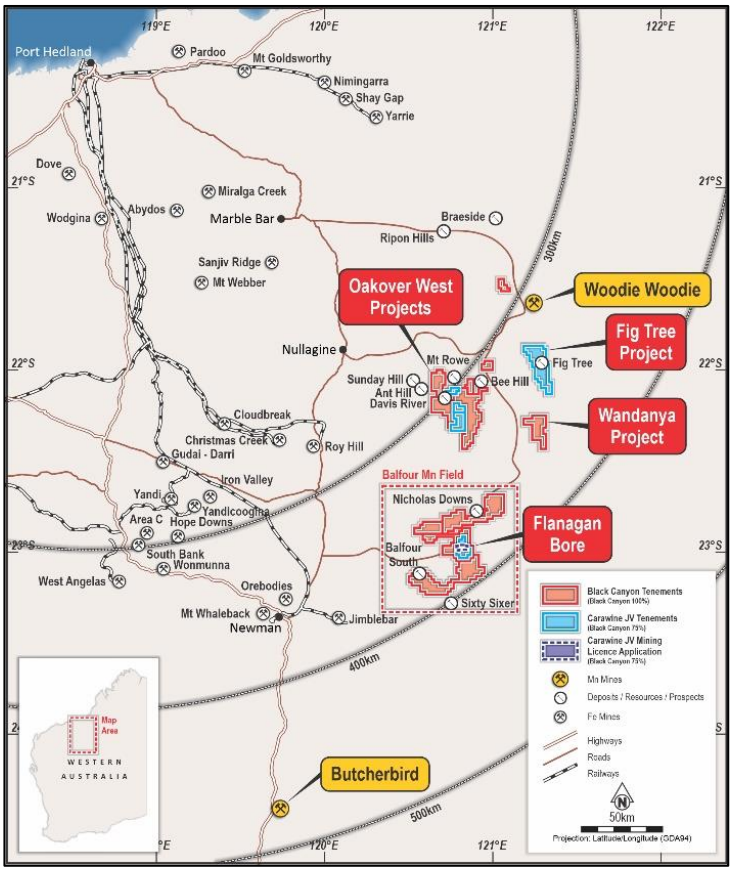
About Black Canyon



Black Canyon has consolidated a significant land holding totalling 2,400km^2 in the underexplored Balfour Manganese Field and across the Oakover Basin, in Western Australia.

The emerging potential for the Balfour Manganese Field is evident by the size of the geological basin, mineral resources identified to date, distance from port, potential for shallow open pit mining and a likely beneficiated Mn oxide concentrate product grading between 30 and 33% Mn. Black Canyon holds several exploration licenses 100% within the Balfour Manganese Field along with a 75% interest in the Carawine Joint Venture with ASX listed Carawine Resources Limited. A Mineral Resource (Measured and Indicated) of **171Mt @ 10.3% Mn** has been defined at Flanagan Bore which is part of the Carawine JV[3].

Manganese continues to have attractive fundamentals where it is essential and non-substitutable in the manufacturing of alloys for the steel industry and a critical mineral in the cathodes of Li-ion batteries.

Compliance Statements

Reporting of Exploration Results and Previously Reported Information

The information in this report that relates to Exploration Results is based on, and fairly represents, information and supporting documentation reviewed by Mr Brendan Cummins, Executive Director of Black Canyon Limited. Mr Cummins is a member of the Australian Institute of Geoscientists, and he has sufficient experience which is relevant to the style of mineralisation and type of deposits under consideration and to the activity which has been undertaken 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 Cummins consents to the inclusion in this release of the matters based on the

information in the form and context in which they appear. Mr Cummins is a shareholder of Black Canyon Limited.

The information in this report that relates to metallurgical testwork results is based on information reviewed by Mr David Pass, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Pass is an employee of BatteryLimits and consultant to Black Canyon Limited. Mr Pass has sufficient experience relevant to the mineralogy and type of deposit under consideration and the typical beneficiation thereof to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition). Mr Pass consents to the inclusion in the report of the matters based on the reviewed information in the form and context in which it appears.

For further information, please refer to ASX announcements dated 17 May 2021, 10 June 2021, 7 July 2021, 5 October 2021, 4 January 2022, 8 February 2022, 21 February 2022, 2 March 2022, 23 March 2022,13 April 2022, 9 June 2022, 7 September 2022, 15 September 2022, 11 October, 21 & 24 November 2022, 5 December 2022, 28 December 2022, 14 February 2023, 27 March 2023, June 1 2023, June 14 2023, June 17 2023, July 14 2023, 23 August 2023, 5 September 2023, 26 September 2023 and 12 October 2023 which are available from the ASX Announcement web page on the Company's website. The Company confirms that there is no new information or data that materially affects the information presented in this release that relate to Exploration Results and Mineral Resources in the original market announcements.

Note 3 ASX release 24/11/2022 Mineral Resource increases by 64% at Flanagan Bore.

Appendix 1. Locations of the sample used in the Hydrometallurgical testwork

Target	Status	East GDA94	North GDA94	*In situ* Mn Grade (%)
West Valley		267685	7533453	6.97
Mt Divide		269337	7534692	12
Pickering	Dril Target	255735	7467834	**14.8**
Damsite	Dril Target	252428	7471312	**20.2**
Balfour East	Dril Target	257186	7435086	**21**
Hurricane		256541	7462987	**28.5**
KR1	Drill Target	276813	7475563	**25**

Appendix 2.

FastMarket (MB-MN-0008) Manganese sulphate 32% Mn min, battery grade, ex-works mainland China, yuan/tonne.

Quality: Powder, accepted by buyer for use in battery applications and with the chemical composition Mn 32% min, Fe 0.001% max, Zn 0.001% max, Cu 0.001% max, Pb 0.001% max, Cd 0.0005% max, K 0.01% max, Na 0.01% max, Ca 0.01% max, Mg 0.01% max, Ni 0.005% max, Co 0.005% max, insoluble residue 0.01% max, PH 4.0-6.5.

Appendix 3. JORC 2012 Table 1

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.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *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.*	• Shallow hand dug trench samples of *in situ* manganese and clay material comprising 1 to 2m trench, dug down 20 to 30cm to produce a 20kg to 30kg sample. • Each sample was described at the site and time of collection to ensure accurate records of sampled material. Samples were selected based on mineralisation. • The samples are selective but representative of the outcrop from which they were taken. • Surface sampling is an industry wide field technique for establishing metal content to understand potential tenor of the underlying mineralisation.
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).*	• Not applicable
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *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.*	• Not applicable
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.* • *Whether logging is qualitative or quantitative in nature.*	• All samples have been logged at the time and location of collection, enabling them to be placed in geological context. • All surface samples have been logged

Criteria	JORC Code explanation	Commentary
	Core (or costean, channel, etc) photography. • *The total length and percentage of the relevant intersections logged.*	and photographed to high detail.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• Samples were collected dry and consisted of multiple chips and soil/clay material. • Samples were between a nominal 20kg - 30kg weight and placed directly in to numbered plastic buckets at the collection point. • Appropriate assay techniques were designated at the point of collection based on the perspective commodity. • Single trench samples.
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.* • *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.* • *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.*	• The samples were submitted to NATA accredited ALSChemex Metallurgy in Balcatta • The 20 to 30kg samples were crushed and homogenised prior to splitting to produce the *in situ* manganese grade. • The sample was then analysed using method ME-XRF26s for manganese ores using fusion disc XRF for Fe, SiO2, Mn, Al2O3, • Black Canyon did not insert standards or any other QAQC material. • The assay data has sufficient quality for the reporting of Exploration Results at this early stage of exploration and processing understanding.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Assay results summarised in the context of this report have been rounded appropriately. • The results have been reviewed by other technical members of the Board. • There has been no drilling completed and thus no twin holes. • No assay data has been adjusted.
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.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Sample locations were surveyed by a handheld GPS +/-5m, at the time of sample collection. • RL was not recorded and is not relevant to surface samples. • Coordinates reported are GDA Zone 51. • Location data is considered to be of sufficient quality for reporting of results at this early stage.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *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.* • *Whether sample compositing has been applied.*	• Selective sampling based on field observation and outcrops identified as hosting potential for mineralisation. • Should not be considered representative of the rock mass as a whole but an indication of the local grade at surface
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.* • *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.*	• Samples are representative only of the material sampled and based on surface outcrops it is unknown if the samples have a bias related to orientation of structures or mineralised horizons.
Sample security	• *The measures taken to ensure sample security.*	• The samples are generally placed in plastic buckets and transported to Perth under the supervision if BCA staff. • The analysing laboratories will normally report any tampering or missing

Criteria	JORC Code explanation	Commentary
		samples. • This is not considered a high risk given the Project location transportation method.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Not applicable at this early stage of exploration

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 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 trench samples were taken across tenements E46/1383, E46/1382, E46/1404, E46/1394 and E46/1396 • Black Canyon owns these licenses 100% • The tenements are subject to Native title and forms part of a Heritage Agreements with the Palyku-Jartay, Njamal and Karlka Nyiyaparli People
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Previous exploration work on the tenements is limited with the majority of the targets mentioned in this release remaining undrilled. • The exception is Hurricane where FMG drilled a number of holes into the target and reported high grade manganese intersects.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The tenements are located within the Balfour Manganese Field, the edges of which are defined by the Neoarchaean Fortescue Group. Most of the tenements are covered by quaternary alluvium, sheetwash and outcrop only exists within the southern part and consists of rocks of the Manganese Group, mainly the Encheddong Dolomite and Balfour Formation. The tenements contain widespread manganese scree associated with manganese enriched Balfour Formation shales. • The hydrothermal styles of mineralisation are typically located inside and at the contact between the Carawine Dolomite and the Pinjian Chert from the upper Hamersley Group. The mineralisation shows a distinct alteration haloe with the core dominated by manganese radiating out to iron oxides such as geothite and limonite.

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.*
	• *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.*
		• All grab sample location data is presented in the text

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade*	• No data aggregation has been undertaken on single point samples

Criteria	JORC Code explanation	Commentary
	truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. • *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.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *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 drill widths or intervals reported
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.*	• See body of the release for a tabulation of Mn *in situ* and upgraded assay results
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.*	• Information considered material to the reader's understanding of the sampling and results have been reported in the body of the text
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.*	• All information considered material to the reader's understanding and context of the results have been reported. • All trench sample data has been reported in the body of the text
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.*	• Further hydrometallurgical test work will be undertaken on some of the samples mentioned in this release using larger samples.