

12 August 2020

## *Moonshine Magnetite Resource Upgrade*

### **Announcement Highlights**

- **RCR Mining Technologies (subsidiary of NRW Holdings ASX: NRH) appointed to examine rail unloading infrastructure solution at Esperance Port**
- **Macarthur Minerals announces a resource upgrade for the Moonshine magnetite deposit at Lake Giles**
- **Measured Mineral Resource of approximately 53.9 Mt and Indicated Mineral Resources of 218.7 Mt**
- **Macarthur now has sufficient resources in the appropriate categories to progress its Feasibility Study**
- **Resource upgrade follows recently announced Proposal for development of a Commercial Track Access Agreement received from Arc Infrastructure and the announcement of plans to develop haul road and rail siding infrastructure near Lake Giles**

Macarthur Minerals Limited (TSX-V: MMS) (ASX: MIO) (the “Company” or “Macarthur”) is pleased to present the updated Mineral Resource estimate for the magnetite deposits at its Lake Giles Iron Project in Western Australia, which has been completed by CSA Global Pty Ltd (CSA Global).

The previous Mineral Resource estimates presented to the market between 2009<sup>1</sup> and 2019<sup>2</sup> consisted entirely of Inferred resources, including 710 million tonnes (“Mt”) at the Moonshine deposits. During 2019 the Company completed a program of infill drilling across some of the Moonshine deposit to upgrade the Mineral Resource category to include Indicated and Measured resources. The Mineral Resource upgrade has delivered sufficient resources in the appropriate categories to underpin the current Lake Giles Iron Project Feasibility Study.

The updated Mineral Resource estimates incorporate the recent drill assays and has resulted in an increase in the size of the Moonshine mineral resources including resource category upgrades to now include Measured and Indicated resources. Approximately 30% of the Moonshine resource is now classified as Indicated with approximately 7.5% classified in the Measured category.

### **Highlights of Mineral Resource estimates:**

- Measured resources of **53.9 Mt at 30.8% Fe head grade and 66.0% Fe DTR concentrate grade**
- Indicated resources of **218.7 Mt at 27.5% Fe head grade and 66.1% Fe DTR concentrate grade**
- Inferred resources of **997.0 Mt at 28.4% Fe head grade and 64.6% Fe DTR concentrate grade**

## Premium Australian iron ore



**Cameron McCall, President and Executive Chairman of Macarthur Minerals commented:**

*“The completion of the updated Mineral Resource estimate for Macarthur’s magnetite deposits at its Lake Giles Iron Project is a major milestone for the Company as it progresses its Feasibility Study. The updated estimate includes an increase in the size of the Moonshine and Moonshine North Mineral Resource, with category upgrades including Measured and Indicated resources.*

*With a Measured Mineral Resource totalling 53.9 Mt and Indicated Mineral Resources of 218.7 Mt, Macarthur now has sufficient resources in the appropriate categories to progress its Feasibility Study.*

*Recent announcements concerning the Company’s applications to develop haul road and rail siding infrastructure near Lake Giles and the announcement that the Company has received a Proposal for development of a Commercial Track Access Agreement from Arc Infrastructure means that the Company is now edging closer than ever to making this Project real for shareholders.*

*The Company’s Board and Management are singularly focused on progressing through the key gateways to deliver the Project to maximise the opportunities presented in the current commodity cycle. With our focus now on the many more successes which need to follow, we have committed to a pathway of responsible, respectful and sustainable development. These are the principles and points of difference upon which the Company will focus as an emerging Australian iron ore producer. This is a great outcome for Macarthur and its shareholders.”*

**Mineral Resource Update**

The Lake Giles Mineral Resource estimates have been updated by CSA Global Pty Ltd (“CSA Global”) and reported in accordance with the JORC Code<sup>3</sup>.

The Mineral Resource estimate includes recent infill drilling conducted at the Moonshine deposits as previously disclosed on May 5, 2020 (see full release [here](#)).

Figures 1 and 2 show the distribution of the Mineral Resource categories within the domains hosting the Measured and Indicated Mineral Resources for the Moonshine deposits. Macarthur’s infill drilling program concentrated on just a portion of the previously reported Mineral Resource<sup>2</sup> to establish Measured and Indicated Mineral Resources to underpin the Feasibility Study of the Lake Giles Iron Project. Further drilling beyond the Measured Mineral Resource will be conducted as required however, the Company is confident it has established sufficient Mineral Resources to support its Feasibility Study.

The Inferred Mineral Resources in Moonshine North (western domains) are extended to beyond 200 m below the depth of drilling, with geological continuity at these depths implied based upon results from aeromagnetic surveys. The results from the aeromagnetic surveys covering Moonshine are less clear and there is therefore less confidence in the interpreted depth extension of the host Banded Iron Formation (BIF) unit where there is no drill hole support.

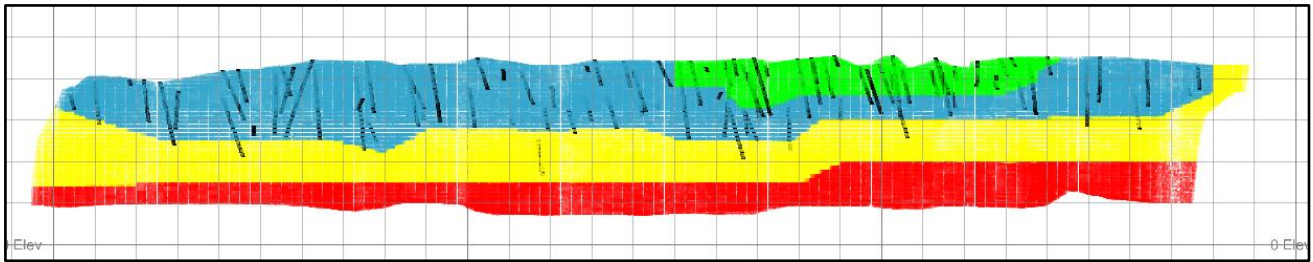


Figure 1. Longitudinal section of Moonshine (west) domain, showing Mineral Resource classification (green=Measured, cyan=Indicated, yellow=Inferred, red=unclassified), and drill hole intercepts (black traces). Grid square 100 m. View to east

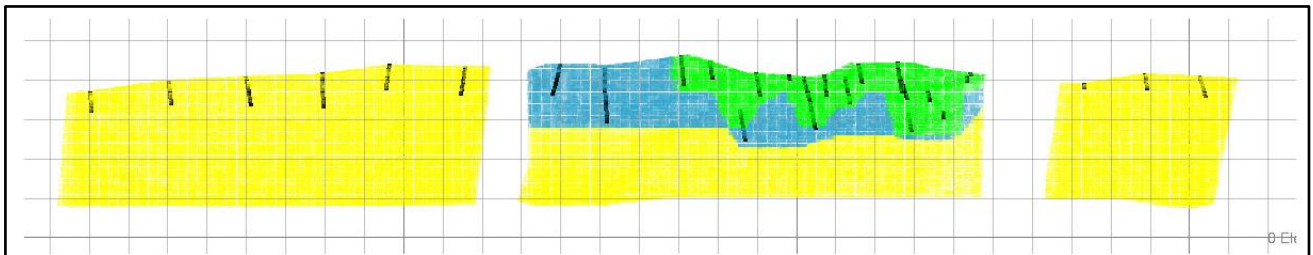


Figure 2. Longitudinal section of Moonshine North (west) domain, showing Mineral Resource classification (green=Measured, cyan=Indicated, yellow=Inferred), and drill hole intercepts (black traces). Grid square 100 m. View to east

<sup>1</sup> NI 43-101 Technical Report filed December 17, 2009, titled "NI 43-101 Technical Report on Lake Giles Iron Ore Project: Western Australia."

<sup>2</sup> NI 43-101 Technical Report filed June 13, 2019, titled "NI43-101 Technical report, Macarthur Minerals Limited, Preliminary Economic Assessment Lake Giles Iron Project."

<sup>3</sup> Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The JORC Code, 2012 Edition.

## Mineral Resource Estimates

The Mineral Resources are reported above a Davis Tube Recovery ("DTR") mass recovery of 15% and presented in Tables 1-3. Previous resource estimates for the Snark, Clark Hill North, Clark Hill South and Sandalwood deposits<sup>1</sup> have been reviewed and reported in accordance with the JORC Code. Locations of the various deposits are presented in Figure 3.

Table 1. Mineral Resource estimate, Moonshine and Moonshine North, where DTR>15%

Category	Tonnes (MT)	Head Grades (%)					Concentrate Grade (%)					
		Fe	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI	DTR	Fe	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI
Measured	53.9	30.8	0.05	45.4	1.6	2.7	32.2	66.0	0.031	6.2	0.2	-0.7
Indicated	218.7	27.5	0.046	51.1	1.4	1.6	31.0	66.1	0.017	6.7	0.1	-0.1
Sub-total	272.5	28.1	0.047	50.0	1.4	1.8	31.2	66.1	0.02	6.6	0.2	-0.2
Inferred	449.1	27.1	0.047	52.6	1.0	1.4	29.2	65.0	0.026	8.4	0.1	0



Table 2. Mineral Resource estimate, Sandalwood, Clark Hill North, Clark Hill South and Snark, where DTR>15%

Deposit	Category	Tonnes (MT)	Head Grades (%)				Concentrate Grade (%)					
			Fe	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI	DTR	Fe	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI
Sandalwood	Inferred	334	31.1	48.4	1.5	-0.6	33.1	64.7	0.03	9.5	0.06	-2.7
Snark	Inferred	69	27.8	49.8	1.6	2.4	23.4	66.2	0.03	7.5	0.13	-2.8
Clark Hill North	Inferred	130	25.8	42.6	1.7	0.14	33.2	62.4	0.04	12.1	0.16	-2.6
Clark Hill South	Inferred	15	32.3	47.0	0.6	0.02	31	63.8	0.02	9.8	0.14	0.0

Table 3. Mineral Resource estimate, all deposits, where DTR>15%

Category	Tonnes (MT)	Head Grades (%)					Concentrate Grade (%)					
		Fe	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI	DTR	Fe	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	LOI
Measured	53.9	30.8	0.05	45.4	1.6	2.7	32.2	66.0	0.031	6.2	0.2	-0.7
Indicated	218.7	27.5	0.046	51.1	1.4	1.6	31.0	66.1	0.017	6.7	0.1	-0.1
Sub-total	272.5	28.1	0.047	50.0	1.4	1.8	31.2	66.1	0.02	6.6	0.2	-0.2
Inferred	997.0	28.4	0.05	49.6	1.3	0.6	30.6	64.6	0.03	9.2	0.1	-1.5

Notes (for all Tables):

- Figures contained within the Tables have been rounded.
- Resource estimates are based on block models constructed using three dimensional geological wireframes.
- Mineral Resources are reported from the block models above a DTR cut-off grade of 15%
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

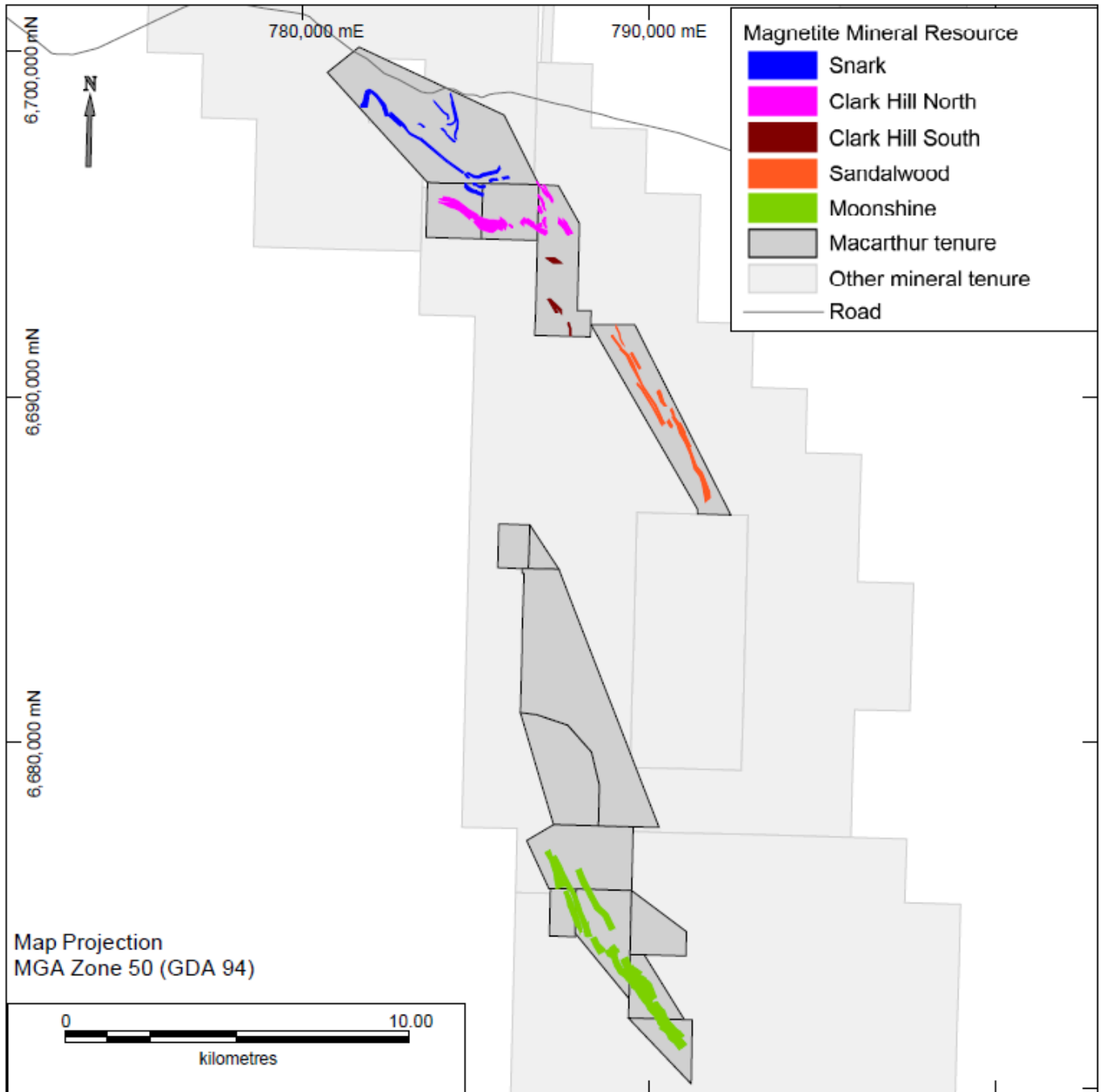


Figure 3. Plan view of the Magnetite deposits of the Lake Giles Iron Project

### Geology and Geological Interpretation

The outcropping geology of the project area is comprised of a combination of un-altered silica-rich banded iron formations (BIFs) and altered, enriched haematite / goethite BIFs. Weathering has resulted in the leaching of the majority of the silica from the BIFs, thus producing a rock rich in iron and low in silica, near surface. These enriched bands vary from 10 m to 150 m in true thickness and are steeply dipping at 70°–90°.



The main zones of mineralisation are interpreted as a series of thick tabular units, with moderate to minimal structural deformation. More intense deformation is modelled at the south edge of the Moonshine prospect with several synclinal structures and possible shearing related to recumbent folds, which increase the apparent thickness of the zones of mineralisation.

Depth and consistency of mineralisation has been confirmed deeper than 250 m below surface as demonstrated by results from several drill holes, confirming a consistent easterly dip of the hanging wall for the majority of the Moonshine and Moonshine North prospects.

A region of lower grade, highly siliceous iron mineralisation (>60% SiO<sub>2</sub>) is occasionally observed in the footwall of the thicker western units, especially in Moonshine, and is generally referred to as the siliceous footwall. The siliceous footwall is characterised by strongly siliceous BIF with much thinner iron rich bands. It appears to be a secondary feature of the primary source BIF unit, as it varies in thickness itself, but the general thickness of the main BIF units tends to remain fairly constant over the entire strike of the larger tabular BIF bodies. Where the siliceous footwall unit demonstrates strike continuity of > 100 m, the siliceous zone has been excised from the geological domains hosting the magnetite Mineral Resource.

A representative cross section through the Moonshine deposit is presented in Figure 4, showing the host BIF unit and mineralisation domain (where DTR>15%), with drill holes. All of the deposits reported here exhibit similar geometry of the host geological units as shown in Figure .

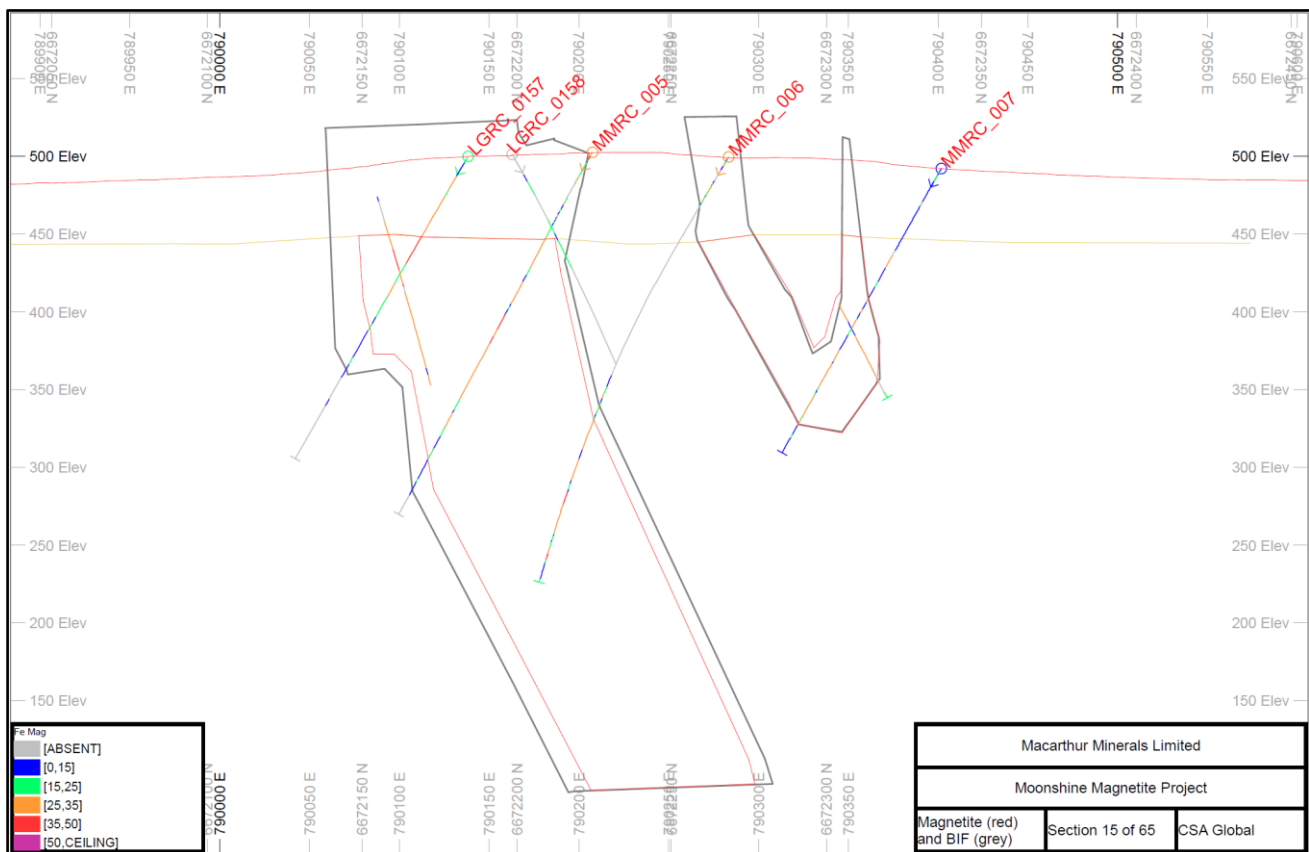


Figure 4. Cross section through Moonshine, showing host BIF (grey) and mineralisation envelope (where DTR>15%, red). Also shown are 'base of oxidation' (yellow surface) and topographic surface (red). Drill holes shown with traces coloured by Fe%. View to NNW.



## Drilling Techniques

The Lake Giles Magnetite deposits were drilled with either reverse circulation (RC) or diamond core drilling. The RC holes are drilled with a 140 mm diameter hammer, often on track mounted rigs due to the rugged terrain of the deposit. Diamond holes were drilled with HQ diameter core, or larger PQ diameter core if metallurgical samples were required. A total of 359 RC holes (63,733 m) and 14 diamond holes (2,809.5 m) were drilled in the Lake Giles Magnetite Project. Not all holes penetrated mineralisation. The Moonshine and Moonshine North deposits, hosting the Measured and Indicated Mineral Resources, recorded nine diamond holes (1,807.5 m) and 236 RC holes (43,156 m) in the drill hole database.

After drilling, the collars of all holes included in the Mineral Resource estimates were surveyed by high accuracy Real Time Kinematic GPS (RTKGPS). RTKGPS surveys, which were undertaken by licensed surveyors are accurate to within 50 millimetres in three dimensions. Downhole surveys were performed by external contractors before 2019 and by the drilling contractor in 2019, using a Reflex EZ-Giro tool. Measurements were generally taken at 10 m intervals.

## Sampling and Sub-sampling Techniques

RC drilling was used to obtain 1 m samples, via a 3-tier riffle splitter or rotary cone. Samples were predominantly dry. RC samples were weighed and a recovery (%) was estimated per metre of drill penetration. Each sample was geologically logged at the drill rig, with a 3 kg sample split submitted to the assay laboratory. Many of the 1 m samples were composited at the drill rig to 5 m length samples, several which were selected for DTR analysis.

Diamond core recoveries were recorded by measuring the length of drill core retrieved per metre of drill penetration. Core was cut in half using an Almonte electric core saw in competent ground and hand split in clay at either 1 m intervals or to geological contacts.

Diamond drill core and RC chip samples were geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining, and metallurgical studies.

Samples were delivered to the analytical laboratory where they were crushed to 3 mm, then pulverized to 105µm (p95).

Certified reference materials (CRMs, or standards) were used throughout the drilling programs to test analytical accuracy, at a rate of 1:50 with at least one standard inserted per drill hole. Field duplicates were collected at a rate of 1:25 prior to 2019 and 1:20 in 2019. Pulp duplicates were also analysed to test for analytical accuracy. The assay laboratories conducted their own QAQC analyses and results were provided to Macarthur. The QAQC procedures and results showed that acceptable levels of accuracy and precision were established.

Selected sample splits were ground to p95 45µm and subjected to DTR testing with x-ray fluorescence (XRF) analysis performed on head and concentrate material. A mass recovery estimate was calculated, which is the percentage of the sample that is considered to be recoverable by magnetic separation. The magnetite product is contained in this recovered fraction.

## Sample Analysis Method

Pulp samples were analysed for the standard suite of iron ore elements by XRF, considered industry standard practice for iron ore. All samples were analysed for both head and concentrate assays. For both sample analyses and DTR test work, drill samples taken between 2007 and 2013 were analysed by Amdel / Ultratrace, and the samples taken in 2019 during the Moonshine drilling programme were analysed by SGS.



## Estimation Methodology

Drill hole data was sourced from a relational MS Access database. Macarthur provided the geological and mineralisation interpretations to CSA Global as 3D wireframe solids and surfaces. The drill hole samples were flagged within the mineralisation domains, and geostatistical studies carried out for the head and concentrate assay data, including variography to ascertain the spatial variation of the various grade variables.

A block model was constructed for the Moonshine and Moonshine North deposits using Datamine software, with parent block sizes 25 m (along strike) x 25 m (across strike) by 10 m (vertical). A larger block size was used for the magnetite deposits to the north of Moonshine (Sandalwood, Clark Hill, and Snark). Head and concentrate grades, and mass recovery, were estimated into the block model using ordinary kriging. A minimum of 8 and maximum of 18 samples were used in any one block estimate, with a maximum of 4 samples per drill hole. Search ellipsoid radii varied between the deposits. Typically, a primary search ellipse of 240 m along strike and down plunge, by 120 m down dip by 40 m across strike was used.

Block grades were validated by visually comparing block and adjacent drill sample grades, by the use of swath plots, and by comparing mean sample and block grades by mineralisation domain.

A total of 624 drill samples with SG measurements were captured within the mineralisation domains and statistically assessed to determine the mean and ranges, and to see if any excessively low or high SG values were present. Three mineralisation domains contain SG data. A further 400 samples were taken from the BIF oxide zones, or the footwall and hanging wall waste zones. Core samples were sealed prior to immersion in water. A conventional Archimedes wet/dry weighing was used to measure density.

Algorithms were developed to calculate the density to apply to the Moonshine and Moonshine North block models based upon correlations between the head Fe grade from assays, and the corresponding SG value of the sample. The density algorithms as applied to the Mineral Resources, are given here:

Moonshine:                     $DENSITY = (0.0241 * FE) + 2.624$

Moonshine North:          $DENSITY = (0.0295 * FE) + 2.468$

Moonshine (East):          $DENSITY = (0.0293 * FE) + 2.492$

The Sandalwood, Clark Hill North, Clark Hill South, and Snark Mineral Resources were all applied a density value of 3.3 t/m<sup>3</sup>, which is a typical density value for the style of mineralisation, and is supported by pycnometer test work of drill samples.

## Mineral Resource Classification

Classification of the Mineral Resource estimates was carried out considering the geological understanding of the deposit, QAQC of the samples, density data and drill hole spacing.

The Measured Mineral Resources were based upon a confirmed understanding of the geological and grade continuity. Drill spacing is typically 25 m along the northerly strike, with often 2 to 3 holes per section. The Measured volumes also contain samples subject to DTR test work, with associated assays from the recovered concentrates. SG measurements were also available.

The Indicated Mineral Resources were based upon an assumed understanding of the geological and grade continuity. Drill spacing is typically 25 – 50/100 m along the northerly strike, with at least one hole per section. The Indicated volumes also contain samples subject to DTR test work, with associated assays from the recovered concentrates. SG measurements may also be available.





The Inferred Mineral Resources were based upon an implied understanding of the geological and grade continuity. Some mineralisation domains are only cut by one drill hole, and the geological models are strongly guided by surface mapping of the BIF outcrops. Drill spacing is typically  $\geq 100$  m along the northerly strike. DTR and SG results are generally absent from within the Inferred volumes, although the Sandalwood, Clark Hill North, Clark Hill South, and Snark Mineral Resources are supported by sufficient DTR test work results to support the reporting of concentrate grade estimates.

Figures 1 and 2 demonstrate the application of the classification to the Mineral Resource estimate.

All available data was assessed and the Competent Persons relative confidence in the data was used to assist in the classification of the Mineral Resource. The current classification appropriately reflects the Competent Person's view of the deposit.

### **Cut-off Grade**

The Mineral Resources are quoted from blocks above 15% DTR. This cut-off is also the domain cut-off. The DTR cut-off is required to ensure a higher volume of magnetite bearing mineralisation is selected, removing the rock volumes with low magnetite content, such as the siliceous bands within the magnetite bearing rock (BIF).

### **Modifying Factors**

A Preliminary Economic Analysis (PEA, and similar to a Scoping Study) was published in 2011 and updated in 2019 which showed that the Moonshine and Moonshine North Magnetite deposits could be mined by a conventional open cut mining method, followed by crushing and fine grinding and magnetic separation to achieve a magnetite product. No mining studies have been carried out on the Sandalwood, Clark Hill, and Snark Magnetite deposits.

Macarthur has been working on a route-to-market for the project and has confirmed capacity should be available on the rail network owned by Arc Infrastructure. The rail network runs to the Port of Esperance owned by the Western Australian Government. The port has facilities for iron ore storage and handling with a ship-loader with proven capacity of 12 Mtpa. The Esperance Port is currently handling approximately 6 Mtpa and Macarthur is working towards securing capacity.

Macarthur has gained State and Commonwealth environmental approval to develop its co-located Ularring Hematite Project. Additional environmental approvals are required to develop the Lake Giles Magnetite Project and the Company is not aware of any significant environmental reasons why approval is unlikely to be granted.

**On behalf of the Board of Directors, Mr Cameron McCall, Executive Chairman**

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## Competent person

The information in this report that relates to Mineral Resources is based on, and fairly reflects, information compiled by Mr David Williams, a Competent Person, who is an employee of CSA Global Pty Ltd, a member of the ERM group of companies, and a Member of the Australian Institute of Geoscientists (#4176). Mr Williams has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Mr Williams consents to the disclosure of information in this report in the form and context in which it appears.

## Company profile

Macarthur is an iron ore development, gold and lithium exploration company that is focused on bringing to production its Western Australia iron ore projects. The Lake Giles Iron Project mineral resources include the Ularring hematite resource (approved for development) comprising Indicated resources of 54.5 million tonnes at 47.2% Fe and Inferred resources of 26 million tonnes at 45.4% Fe; and the Lake Giles magnetite resource of 53.9 million tonnes (Measured), 218.7 million tonnes (Indicated) and 997 million tonnes (Inferred). Macarthur has prominent (~721 square kilometer tenement area) gold, lithium and copper exploration interests in Pilbara region of Western Australia. In addition, Macarthur has lithium brine Claims in the emerging Railroad Valley region in Nevada, USA.

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## Caution Regarding Forward Looking Statements

Certain of the statements made and information contained in this press release may constitute forward-looking information and forward-looking statements (collectively, "forward-looking statements") within the meaning of applicable securities laws. All statements herein, other than statements of historical fact, that address activities, events or developments that the Company believes, expects or anticipates will or may occur in the future, including but not limited to statements regarding expected completion of the Feasibility Study; conversion of Mineral Resources to Mineral Reserves or the eventual mining of the Project, are forward-looking statements. The forward-looking statements in this press release reflect the current expectations, assumptions or beliefs of the Company based upon information currently available to the Company. Although the Company believes the expectations expressed in such forward-looking statements are based on reasonable assumptions, such statements are not guarantees of future performance and no assurance can be given that these expectations will prove to be correct as actual results or developments may differ materially from those projected in the forward-looking statements. Factors that could cause actual results to differ materially from those in forward-looking statements include but are not limited to: unforeseen technology changes that results in a reduction in iron or magnetite demand or substitution by other metals or materials; the discovery of new large low cost deposits of iron magnetite; the general level of global economic activity; failure to complete the FS; inability to demonstrate economic viability of Mineral Resources; and failure to obtain mining approvals. Readers are cautioned not to place undue reliance on forward-looking statements due to the inherent uncertainty thereof. Such statements relate to future events and expectations and, as such, involve known and unknown risks and uncertainties. The forward-looking statements contained in this press release are made as of the date of this press release and except as may otherwise be required pursuant to applicable laws, the Company does not assume any obligation to update or revise these forward-looking statements, whether as a result of new information, future events or otherwise.

## Attachment 1

## JORC Code, 2012 Edition – Table 1 Lake Giles Magnetite Project

## Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>Nature and quality of sampling (e.g. 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.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>In cases where ‘industry standard’ work has been done this would be relatively simple (e.g. ‘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 (e.g. submarine nodules) may warrant disclosure of detailed information.</li> </ul>	<ul style="list-style-type: none"> <li>The deposit was sampled using diamond core and reverse circulation (RC) drill holes between 2008 (commencement of the assessment of the Lake Giles Magnetite Project) and 2019. RC drilling was the dominant sampling technique used. Diamond core samples were largely reserved for metallurgical and geotechnical studies; however, some were used for Mineral Resource estimation.</li> <li>Diamond core recoveries were recorded by measuring the length of drill core retrieved per metre of drill penetration. RC samples were weighed and a recovery (%) was estimated per metre of drill penetration. RC chip recovery information was recorded in digital logs.</li> <li>RC drilling was used to obtain 1 m samples, via 3-tier riffle splitter or rotary cone, with a 3 kg sample split submitted to the assay laboratory and pulverised to produce a 30 g pulp charge for XRF analysis.</li> <li>Some compositing of samples is used to reduce costs of DTR analysis, whereby composites of between 1 m and 7 m are used, depending on the continuity and metre-scale head grade decided by a geologist.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. 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.).</li> </ul>	<ul style="list-style-type: none"> <li>RC drill holes were drilled by either a Schramm T660 (Volvo 8x4 wheel rig), or a track mounted Schramm T450WS rig or a Hydco 350 mounted on a 2008 Tatra 8x8 truck. Choice of drill rig was dependent upon the terrain hosting the drill pads. Drilling diameter for RC holes was generally 140 mm. Diamond drilling for metallurgical purposes used mostly HQ diameter core with occasional PQ core depending on the mass of core required. Core orientation was performed using Reflex apparatus and was unsuccessful for the majority of weathered core.</li> </ul>

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Criteria	JORC Code explanation	Commentary
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>• <i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></li> <li>• <i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Diamond core recoveries were recorded by measuring the length of drill core retrieved per metre of drill penetration. RC samples were weighed and a recovery (%) was estimated per metre of drill penetration.</li> <li>• If sample recoveries were observed becoming sub-optimal by the project geologist, the information was relayed to the driller who adjusted the drilling penetration rate, or other sample recovery drill rig characteristics such as air compression, in order to improve sample recovery. A geologist was present at the drill rigs at all times whilst drilling procedures were under way, and logged all drill samples.</li> <li>• No relationship was observed between sample recovery and Fe (%) grade. No loss of haematite or goethitic fines was observed during drilling.</li> <li>• In heavily fractured zones with strong groundwater flow, recovery can suffer unless appropriate measures are taken.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</i></li> <li>• <i>The total length and percentage of the relevant intersections logged.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Diamond drill core and RC chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Not all drill holes penetrated the BIF host units, but all were used to guide the geological interpretations supporting the Mineral Resource estimates.</li> <li>• Geological logging of drill samples was qualitative in nature for all RC drilling and diamond core samples.</li> <li>• All (100%) drill holes were geologically logged, with lithologies, oxidation, structure, alteration and mineralogy among the geological categories logged.</li> <li>• Moonshine and Moonshine North recorded nine diamond holes (1,807.5 m) and 236 RC holes (43,156 m) in the drill hole database</li> <li>• Clark Hill North recorded five diamond holes (8,551 m) and 60 RC holes (8,551 m).</li> <li>• Clark Hill South recorded nine RC holes (2,086 m).</li> <li>• Sandalwood recorded 38 RC holes (6,933 m).</li> <li>• Snark (magnetite units only) recorded 16 RC holes (3,007 m).</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>• <i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></li> <li>• <i>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</i></li> <li>• <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></li> <li>• <i>Quality control procedures adopted for all sub-sampling stages to</i></li> </ul>	<ul style="list-style-type: none"> <li>• Some diamond core was for metallurgical and geotechnical purposes and therefore not used to support the Mineral Resources estimate, apart from the geological logging.</li> <li>• Diamond core was cut using an Almonte electric core saw in competent ground and hand split in clay at either 1 m intervals or to geological contacts. RC samples were collected at the rig using riffle splitters. Samples were generally dry with some areas wet due to perched water tables. Industry standard diamond and RC drilling techniques were used and are considered appropriate for use in Mineral Resource estimation. For RC drilling, sample quality was maintained</li> </ul>



Criteria	JORC Code explanation	Commentary
	<p><i>maximise representivity of samples.</i></p> <ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></li> </ul>	<p>by monitoring sample volume and by cleaning the splitters on a regular basis. Field duplicates were taken every 20 metres for RC drilling. Quarter splits of core have been taken and recorded as duplicates in the database.</p> <ul style="list-style-type: none"> <li>RC samples passed through a cyclone then passed through a three-tier riffle splitter or rotary cone (depending on drilling campaign and equipment used). Samples were predominantly dry. Occasional single wet samples were obtained at the start of drill rods when groundwater flow was particularly strong. A total of 75% of the sample passed through the splitter to be captured in a residue bucket whilst the remaining 25% of the sample was evenly distributed through the primary sample chute and the field duplicate chute.</li> <li>RC samples were securely delivered to the analytical laboratory where they were crushed to 3 mm fraction, then pulverized to 105µm (p95). The laboratories are accredited to industry standards, and the sample preparation stages likewise to industry standard. The sample preparation is considered appropriate for the mineralisation investigated.</li> <li>Samples were ground to p95 75µm and subjected to DTR testing with XRF analysis performed on head and concentrate material. A mass recovery via DTR was also calculated. A magnetic field strength of 3,000 Gauss was used. A total of 498 samples delivered DTR results from the Moonshine and Moonshine North deposits, 579 from Clark Hill North, 157 from Clark Hill South, 523 from Sandalwood and 64 from Snark.</li> <li>The laboratory collected splits of the sub samples at the crushing and pulverizing stages, with the splits stored. The pulp splits were sourced for laboratory duplicate XRF analyses.</li> <li>Field duplicate samples were taken at the drill rig via the 3-tier riffle splitter or rotary cone.</li> <li>Sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>
<p><b>Quality of assay data and laboratory tests</b></p>	<ul style="list-style-type: none"> <li><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li><i>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.</i></li> <li><i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i></li> </ul>	<ul style="list-style-type: none"> <li>All samples were dispatched to one of three assay laboratories; samples prior to mid-2007 were sent to Genalysis, and from mid-2007 to 2013 dispatched to an Amdel / UltraTrace, and samples from 2019 were analysed by SGS. Pulp samples were analysed for the standard suite of Fe ore elements by XRF, considered industry standard practice for iron ore.</li> <li>DTR work was performed by Amdel / UltraTrace until 2010 and then SGS for the 2019 work.</li> <li>Geophysical analyses etc., were used to assist with the geological interpretation.</li> <li>Standards were used throughout the drilling programs to test analytical accuracy, at a rate of 1:50 and at least one standard inserted per drill hole. Field duplicates were captured at a rate of 1:25 prior to 2019 and 1:20 in 2019. Pulp duplicates were also analysed to test for analytical accuracy. The assay labs conducted their own QAQC analyses and results were provided to Macarthur. The QAQC procedures and results showed that acceptable levels of accuracy and</li> </ul>



Criteria	JORC Code explanation	Commentary
		precision were established.
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>• <i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li>• <i>The use of twinned holes.</i></li> <li>• <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> <li>• <i>Discuss any adjustment to assay data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Significant intercepts were independently verified by alternate company personnel including senior geological management.</li> <li>• Selected RC holes were twinned by diamond core holes. The purpose of the twinning was to provide diamond drill core for geotechnical purposes, especially within the oxidised zones of the deposit. The diamond tails that penetrated the primary zone of mineralisation were no longer twinned to an RC hole. The geological logging from both the RC and diamond holes demonstrate consistency in logging of the primary lithologies and weathering profiles.</li> <li>• Drill hole data was logged by hand at the drill rig, then data was manually entered into spreadsheets. These were imported into an SQL database independently maintained by CSA Global. The database has various criteria, relationships, and triggers to ensure the data entered into the database is valid. Strict security and daily backups are managed by SQL server software. Data was verified by the CP (resources) by randomly cross-checking collar and survey data in the database with independently recorded geospatial data from the drill sites.</li> <li>• No data adjustments were made to assay data in the database.</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>• <i>Accuracy and quality of surveys used to locate drill holes (collar and downhole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i></li> <li>• <i>Specification of the grid system used.</i></li> <li>• <i>Quality and adequacy of topographic control.</i></li> </ul>	<ul style="list-style-type: none"> <li>• All drill hole collars included in the Mineral Resource estimates were surveyed after drilling by high accuracy Real Time Kinematic GPS (RTKGPS). RTKGPS surveys, which were undertaken by licensed surveyors, are accurate to within 50 millimetres in three dimensions.</li> <li>• Down-hole surveys were performed by external contractors (Surtron and ABIMS) before 2019 and by the drilling contractor in 2019, using a Reflex EZ-Giro tool. Measurements were generally taken at 10 m intervals.</li> <li>• All coordinates are in Geocentric Datum of Australia (GDA94, Zone 50).</li> <li>• A LIDAR topographic survey was flown in June 2011. The data was re-sampled from 1 m to 2 m and exported as a wireframe surface in dxf format. The choice of a coarser contour interval has not resulted in any noticeable difference to resource volumes at the 'outcropping' surface of the BIF strata. Drill collars were validated against the DTM elevation. The topographic survey is considered adequate to support the Mineral Resource estimates.</li> </ul>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>• <i>Data spacing for reporting of Exploration Results.</i></li> <li>• <i>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.</i></li> <li>• <i>Whether sample compositing has been applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Drill holes were sited on the many outcropping ridges of haematite / goethite mineralisation, although not all ridges had been drill tested prior to late 2012. Drill hole section lines along the ridges were typically spaced 100 m. Across strike drilling was occasionally used to define depth to base of complete oxidation and verify grades.</li> <li>• Drill hole spacing is deemed sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource classifications applied.</li> </ul>



Criteria	JORC Code explanation	Commentary
		<ul style="list-style-type: none"> <li>Samples were not composited at the drill rig.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Holes were generally angled at 60° across the strike of mineralisation, with occasional vertical orientations, targeting strata typically dipping at 70° to 90° towards the angle of drilling. Some bias of sampling was anticipated based upon the angle of drill hole interception against the dip of haematite bearing strata, however this bias is not considered detrimental to the Mineral Resource estimate.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>The measures taken to ensure sample security.</li> </ul>	<ul style="list-style-type: none"> <li>On completion of each hole the calico sample bags were placed in polyweave bags, then transferred to the Ularring exploration compound where they were securely stored. The polyweave bags were placed in large bulka bags and transported to the assay laboratory depot in Kalgoorlie and then Perth using a contracted freight company. At all times the samples were under the security of either Macarthur or the transport company personnel, and then under the security of the assay laboratory. Security tags were used for all bulk sample dispatches (i.e. 'bulka' bags), as well as the majority of individual polyweave bags.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of sampling techniques and data.</li> </ul>	<ul style="list-style-type: none"> <li>The Competent Person (Mineral Resources) reviewed sampling procedures during site visits. Any problems observed were discussed with the geological staff on roster, and the problems were quickly corrected, with no detrimental impact upon the Mineral Resources noted. Senior geological staff from Macarthur regularly vetted sampling procedures.</li> </ul>



Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary																																																																																																
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>At present Macarthur manages 15 contiguous Mining Leases covering a total area of approximately 62.4 km<sup>2</sup>. Macarthur also has two pending miscellaneous licences for a haul road and rail siding to facilitate transport of iron ore from the mining leases to the rail line approximately 90 km south of the project, and a further two pending licenses for water exploration.</li> <li>Macarthur Minerals Ltd, through its wholly owned subsidiary Macarthur Iron Ore Pty Ltd, is the registered holder of or registered applicant for the Tenements.</li> <li>The following table details the tenure at the Project, effective 3 August 2020.</li> </ul> <table border="1"> <thead> <tr> <th>Tenement</th> <th>Status</th> <th>Holder</th> <th>Area (Ha)</th> <th>Grant Date</th> <th>Expiry Date</th> </tr> </thead> <tbody> <tr><td>M30/0206</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>189</td><td>2/07/2007</td><td>1/07/2028</td></tr> <tr><td>M30/0207</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>171</td><td>2/07/2007</td><td>1/07/2028</td></tr> <tr><td>M30/0213</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>258</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0214</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>260</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0215</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>521</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0216</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>55</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0217</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>114</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0227</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>504</td><td>13/06/2011</td><td>12/06/2032</td></tr> <tr><td>M30/0228</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>362</td><td>2/07/2007</td><td>1/07/2028</td></tr> <tr><td>M30/0229</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>205</td><td>2/07/2007</td><td>1/07/2028</td></tr> <tr><td>M30/0248</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>585</td><td>22/02/2012</td><td>21/02/2033</td></tr> <tr><td>M30/0249</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>1206</td><td>22/02/2012</td><td>21/02/2033</td></tr> <tr><td>M30/0250</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>102</td><td>5/03/2013</td><td>4/03/2034</td></tr> <tr><td>M30/0251</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>1246</td><td>27/11/2012</td><td>26/11/2033</td></tr> <tr><td>M30/0252</td><td>Live</td><td>Macarthur Iron Ore Pty Ltd</td><td>478</td><td>27/05/2013</td><td>26/05/2034</td></tr> </tbody> </table>	Tenement	Status	Holder	Area (Ha)	Grant Date	Expiry Date	M30/0206	Live	Macarthur Iron Ore Pty Ltd	189	2/07/2007	1/07/2028	M30/0207	Live	Macarthur Iron Ore Pty Ltd	171	2/07/2007	1/07/2028	M30/0213	Live	Macarthur Iron Ore Pty Ltd	258	13/06/2011	12/06/2032	M30/0214	Live	Macarthur Iron Ore Pty Ltd	260	13/06/2011	12/06/2032	M30/0215	Live	Macarthur Iron Ore Pty Ltd	521	13/06/2011	12/06/2032	M30/0216	Live	Macarthur Iron Ore Pty Ltd	55	13/06/2011	12/06/2032	M30/0217	Live	Macarthur Iron Ore Pty Ltd	114	13/06/2011	12/06/2032	M30/0227	Live	Macarthur Iron Ore Pty Ltd	504	13/06/2011	12/06/2032	M30/0228	Live	Macarthur Iron Ore Pty Ltd	362	2/07/2007	1/07/2028	M30/0229	Live	Macarthur Iron Ore Pty Ltd	205	2/07/2007	1/07/2028	M30/0248	Live	Macarthur Iron Ore Pty Ltd	585	22/02/2012	21/02/2033	M30/0249	Live	Macarthur Iron Ore Pty Ltd	1206	22/02/2012	21/02/2033	M30/0250	Live	Macarthur Iron Ore Pty Ltd	102	5/03/2013	4/03/2034	M30/0251	Live	Macarthur Iron Ore Pty Ltd	1246	27/11/2012	26/11/2033	M30/0252	Live	Macarthur Iron Ore Pty Ltd	478	27/05/2013	26/05/2034
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<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>The property was previously explored for nickel (1968 to 1972) and gold (Aztec, Battle Mountain, 1993 to 1998) with limited success. Internickel Australia undertook a detailed evaluation of previous exploration from 2001 to 2005. Macarthur Minerals took over the tenements in 2005 and has been actively exploring for iron mineralisation since. The Ularring</li> </ul>																																																																																																





Criteria	JORC Code explanation	Commentary
		Hematite Project has reported Mineral Resources, with the hematite deposits located adjacent to, and sometimes interspersed, with the Lake Giles Magnetite deposits.
<b>Geology</b>	<ul style="list-style-type: none"> <li>• <i>Deposit type, geological setting and style of mineralisation.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The outcropping geology of the project area is comprised of a combination of un-altered silica rich banded iron formations (BIFs) and altered, enriched haematite / goethite BIFs. Weathering has resulted in the leaching of the majority of the silica from the BIFs, thus producing a rock rich in iron and low in silica, near surface. Below the depth of oxidation (generally between 45–90 m from surface) the BIF units are comprised almost entirely of ferrous/ferric Fe(II,III) iron, silica and small amounts of alumina with occasional incipient iron sulphides (predominantly pyrite). The Fe grades are consistently between 20 and 40% Fe. Macarthur believes the majority of the underlying BIF units have experienced minimal metamorphism beyond their original formation. A notable exception to this is a pocket of high grade magnetite mineralisation (up to 15 m true thickness, and continuous along strike for &gt;200m) found in the Moonshine North prospect, which was targeted as part of a co-funded EIS drilling program in 2012 with two diamond drill holes. The pocket of high-grade magnetite mineralisation (in excess of 60% in-situ Fe) was interpreted to be the result of structural and geothermal alteration of the primary BIF fabric.</li> <li>• The main zones of mineralisation are interpreted as a series of thick tabular units, steeply dipping eastward at ~70° with moderate to minimal structural deformation. More intense deformation is modelled at the south edge of the Moonshine prospect with several synclinal structures and possible shearing related to recumbent folds, which increase the apparent thickness of the zones of mineralisation.</li> <li>• Depth and consistency of mineralisation has been confirmed in excess of 250 m below surface through several drill holes, confirming a consistent dip of the hanging wall for the majority of the Moonshine and Moonshine North prospects.</li> <li>• A region of lower grade, highly siliceous (&gt; 60% SiO<sub>2</sub>) is occasionally observed in the footwall of the thicker Western units, especially in Moonshine, and is generally referred to as the siliceous footwall. The siliceous footwall is characterised by strongly siliceous BIF with much thinner iron rich bands. It appears to be a secondary feature of the primary source BIF unit, as it varies in thickness itself, but the general thickness of the main BIF units tends to remain fairly constant over the entire strike of the larger tabular BIF bodies.</li> </ul>
<b>Drillhole information</b>	<ul style="list-style-type: none"> <li>• <i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:</i> <ul style="list-style-type: none"> <li>○ <i>easting and northing of the drillhole collar</i></li> <li>○ <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The Lake Giles Magnetite Project consists of 374 diamond and RC drill holes (66,542.5 m). This includes 14 diamond holes for 2,809.5 m and 359 RC holes for 63,733 m. All of these holes were used to support the Mineral Resource estimate. The Mineral Resource estimate conveys the tenor of grade from the drill holes.</li> </ul>



Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li>○ <i>dip and azimuth of the hole</i></li> <li>○ <i>downhole length and interception depth</i></li> <li>○ <i>hole length.</i></li> <li>● <i>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.</i></li> </ul>	
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>● <i>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.</i></li> <li>● <i>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.</i></li> <li>● <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></li> </ul>	<ul style="list-style-type: none"> <li>● Exploration results are not being reported here.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>● <i>These relationships are particularly important in the reporting of Exploration Results.</i></li> <li>● <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></li> <li>● <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'downhole length, true width not known').</i></li> </ul>	<ul style="list-style-type: none"> <li>● True width of mineralisation is derived from detailed three-dimensional geological rock models.</li> <li>● Various ore bodies are intercepted at varying degrees of obliqueness, therefore a simple conversion to true thickness from down hole intercepts is not possible.</li> <li>● General geometry of mineralisation is sub-vertical tabular bodies generally dipping between 60° and 90°, with true thickness of mineralisation between several metres and 140 m.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>● <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>● Maps showing drill hole collar locations and prospects are presented in the body of this report.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>● <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>● Drill hole information is incorporated into the Mineral Resource estimates.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Additional exploration data such as ground/air magnetic surveys, gravity and geochemical soil sampling are mentioned in technical reports available from the company website. Metallurgical testing is reported in full detail in all technical reports and updated as required. Bulk density data is reported in full detail with explanations of final assumptions and modelling parameters included in technical reports. All relevant geotechnical and rock characteristic data is fully described in reports.</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul style="list-style-type: none"> <li>A Bankable Feasibility Study (BFS) is planned for the Moonshine and Moonshine North deposits. A metallurgical test work program will be undertaken using representative core samples to develop an optimal grind size and flowsheet to produce a saleable magnetite concentrate.</li> <li>Further resource drilling may be conducted in the future to upgrade the Mineral Resource category for Mineral Resource currently classified as Inferred. This work will be undertaken as required after the release of the BFS.</li> <li>No immediate resource drilling is planned for the Snark, Clark Hill South, Clark Hill North and Sandalwood deposits. These deposits are planned for future development after development of the Moonshine Project, comprising the Moonshine and Moonshine North deposits.</li> <li>Diagrams and maps of potential areas for resource expansion, extension and upgrading (in category) are produced in-house for review and approval by management before drilling/exploration programs are finalized and executed.</li> </ul>

### Section 3 Estimation and Reporting of Mineral Resources – Sandalwood, Clark Hill North, Clark Hill South, Snark

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Measures taken to ensure that data has not been corrupted by, e.g. transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<ul style="list-style-type: none"> <li>Data used in the Mineral Resource estimate is sourced from a database dump, provided in the form of an MS Access database, from the DataShed relational database hosted by CSA Global. Relevant tables from the database were exported to MS Excel format and converted to csv format for import into CAE Studio 3 software for use in the Mineral Resource estimate.</li> <li>Validation protocols for the data entered into the database are described in Section 1.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>The Competent Person (Mineral Resources) inspected the property on several occasions between 2008 and 2012. During each site visit, drilling operations and sampling procedures were inspected, proposed drill hole locations reviewed, geological outcrops were inspected, and geological and project discussions held with Macarthur staff. All resource definition drilling occurred during this time for the Clark Hill, Sandalwood and Snark deposits.</li> <li>COVID 19 travel restrictions have prevented the Competent Person from visiting the</li> </ul>



Criteria	JORC Code explanation	Commentary
		<p>project during 2020. When travel restrictions are lifted, the Competent Person will aim to conduct a site visit in conjunction with other technical staff during the preparation of the Moonshine BFS.</p>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>• <i>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</i></li> <li>• <i>Nature of the data used and of any assumptions made.</i></li> <li>• <i>The effect, if any, of alternative interpretations on Mineral Resource estimation.</i></li> <li>• <i>The use of geology in guiding and controlling Mineral Resource estimation.</i></li> <li>• <i>The factors affecting continuity both of grade and geology.</i></li> </ul>	<ul style="list-style-type: none"> <li>• There is a reasonable level of confidence in the geological interpretation, as reflected in the classification levels of the Mineral Resource. The confidence level is higher for the geometry of the mineralisation, and the true width, than for the depth of mineralisation.</li> <li>• Geological interpretations were based upon geologically logged and chemically analysed drill hole samples and mapping of outcrop. A lower cut-off of 15% DTR or 30% head Fe was used to constrain the mineralisation domains.</li> <li>• Geological factors such as strike and dip of the individual BIF lenses controlled the geometry of the mineralisation domains. Surface mapping of the BIF outcrops guided the geological interpretations.</li> <li>• Mineralisation domains along strike and down dip were curtailed when the grade consistently fell below 30% Fe. The mineralised interpretation used for the estimates extends from the base of oxidation (at an average of approximately 65 m below surface) to the depth of the mineralised drill intersections ranging from approximately 200 m to 350 m below surface.</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The mineralisation extends along a strike extent of 4,500 m (Snark), 3,500 m (Clark Hill North and South) and 6,000 m (Sandalwood).</li> <li>• Ore body true widths vary from 10 m to 140 m. Depth of mineralization commences below the base of oxidation. The mineralization is open at depth with the current drilling. For resource estimation the mineralisation has been constrained by geological knowledge, the available drilling and where appropriate, expected pit depths.</li> </ul>
<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i></li> <li>• <i>The assumptions made regarding recovery of by-products.</i></li> <li>• <i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i></li> <li>• <i>In the case of block model interpolation, the block size in relation to</i></li> </ul>	<ul style="list-style-type: none"> <li>• Datamine Studio and Surpac software were used for geological modelling, block modelling, grade interpolation, Mineral Resource classification and reporting. GeoAccess Professional and Snowden Supervisor were used for geostatistical analyses. Mineralisation domains were based upon a lower cut-off of 30% head Fe or 15% DTR. Mineralisation domains were encapsulated by means of 3D wireframed envelopes. Domains were extrapolated along strike or down dip to half a section spacing or if a barren hole cut the down dip extension before this limit. Drill hole samples were composited to either 1 m or 5 m sample lengths, dependent the deposit being modelled and upon the original sample lengths, and statistical analyses for Fe(%), P(%), SiO<sub>2</sub>(%), Al<sub>2</sub>O<sub>3</sub>(%), LOI(%) and S(%) were carried out. No grade cutting was employed. All RC and diamond drill hole data constrained within the mineralisation envelopes were utilised in the grade interpolation. Grade estimation was by Ordinary Kriging (OK) with Inverse Distance Squared (IDS) estimation concurrently run as a check estimate. A minimum of 12 and maximum of 30 samples were used in any one block estimate. A maximum of 6 composited samples per drill hole were used in any one block estimate. Cell discretisation of 3 x 3 x 3 was used. Grade interpolation</li> </ul>



Criteria	JORC Code explanation	Commentary
	<p><i>the average sample spacing and the search employed.</i></p> <ul style="list-style-type: none"> <li>• <i>Any assumptions behind modelling of selective mining units.</i></li> <li>• <i>Any assumptions about correlation between variables.</i></li> <li>• <i>Description of how the geological interpretation was used to control the resource estimates.</i></li> <li>• <i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li>• <i>The process of validation, the checking process used, the comparison of model data to drillhole data, and use of reconciliation data if available.</i></li> </ul>	<p>was run within the individual mineralisation domains, acting as hard boundaries. Search ellipsoid radii varied between the deposits, typically a primary search ellipse of 300 m along strike by 100 m down dip by 100 m across strike.</p> <ul style="list-style-type: none"> <li>• Grade interpolation results were compared with previous Mineral Resource estimates and any anomalous differences were investigated.</li> <li>• Head grades were estimated for Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, LOI, S and DTR. Concentrate grades were estimated (when assays were available) for Fe, P, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, LOI and S.</li> <li>• Separate block models were created for each deposit. Block sizes for resources varied between 50 m x 50 m x 10 m (Clark Hill North, Snark and Sandalwood), and 10 m x 100 m x 50 m for Clark Hill South.</li> <li>• No SMU assumptions were made.</li> <li>• The strike and dip controlled the orientation of the search ellipse for the grade interpolation runs.</li> <li>• No grade cutting was employed because no assayed grades were recorded with extremely high or low grades. Any assay values of high or low grade in nature were diluted by other surrounding grades and did not adversely impact upon local block estimates.</li> <li>• The grade models were validated by 1) creating slices of the model and comparing to drill holes on the same slice; 2) swath plots comparing average block grades with average sample grades on nominated easting, northing and elevation slices; and 3) mean grades per domain for estimated blocks and flagged drill hole samples. No mining has taken place therefore no reconciliation data was available.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li>• <i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Tonnages are estimated on a dry basis.</li> </ul>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>• <i>The basis of the adopted cut-off grade(s) or quality parameters applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The Mineral Resources are quoted from blocks above 15% DTR. This cut-off grade is also the domain cut-off. The DTR cut-off is required to ensure a higher volume of magnetite bearing mineralisation is selected, removing the rock volumes with low magnetite content.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mineralisation outcrops at surface and was modelled to a depth to which open pit mining may operate. No assumptions have been made to date regarding minimum mining widths or dilution controlling the Mineral Resource estimates.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>Metallurgical test work has been conducted by Promet (2008) on 14 RC holes drilled at the Clark Hill North, Clark Hill South and Snark deposits.</li> <li>The Fe% results from the test samples and the DTR results were higher than the bulk of the intervals used for resource estimation. Samples are considered to represent higher grade intervals rather than the average of the mineralisation.</li> <li>The SiO<sub>2</sub> grades of the recovered concentrate exceeded 10% for grind sizes down to 25 microns. In contrast, drill sample DTR assays showed the majority of results lower than 10%; averaging 9.9% in the east lode samples and 6.6% in the much larger west lode.</li> <li>A reverse flotation test indicates that for the 25 µm grind, a concentrate with less than 5% SiO<sub>2</sub> can be achieved at a mass recovery of 65%.</li> </ul>
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>Environmental factors and assumptions have been examined as part of the PFS for the Ularring Hematite Project, overlapping or immediately adjacent to the Lake Giles Magnetite Project. The Ularring Hematite Project has received State and Commonwealth environmental approvals. Additional environmental surveys are required over areas of the magnetite deposits that are not included in the environmental approvals for the Ularring Hematite Project. Macarthur is not aware of any significant environmental reasons why approval is unlikely to be granted for the Lake Giles Magnetite Project.</li> </ul>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>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.</i></li> <li><i>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</i></li> </ul>	<ul style="list-style-type: none"> <li>For Snark, Clark Hill and Sandalwood, a density value of 3.3t/m<sup>3</sup> was applied to the Mineral Resource estimate, based upon regression formulae derived from Pycnometer test work.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Classification</b>	<ul style="list-style-type: none"> <li><i>The basis for the classification of the Mineral Resources into varying confidence categories.</i></li> <li><i>Whether appropriate account has been taken of all relevant factors (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).</i></li> <li><i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> </ul>	<ul style="list-style-type: none"> <li>Classification of the Mineral Resource estimates was carried out taking into account the geological understanding of the deposit, QAQC of the samples, density data and drill hole spacing. All deposits discussed in this table (Sandalwood, Clark Hill North, Clark Hill South and Snark) are classified as Inferred.</li> <li>The Inferred Mineral Resources were based upon an implied understanding of the geological and grade continuity. Some mineralisation domains are only cut by one drill hole, and the geological models are strongly guided by surface mapping of the BIF outcrops.</li> <li>All available data was assessed and the Competent Persons relative confidence in the data was used to assist in the classification of the Mineral Resource.</li> <li>The current classification assignment appropriately reflects the Competent Person's view of the deposit.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of Mineral Resource estimates.</i></li> </ul>	<ul style="list-style-type: none"> <li>No independent audit of the Mineral Resources has been conducted. Senior geological personnel from Macarthur reviewed the Mineral Resource estimates at the time of original publication and found no fatal flaws or errors in the assumptions used.</li> </ul>
<b>Discussion of relative accuracy/ confidence</b>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>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.</i></li> <li><i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<ul style="list-style-type: none"> <li>An inverse distance estimation algorithm was used in parallel with the OK interpolation, with results very similar.</li> <li>No other estimation method or geostatistical analysis has been performed.</li> <li>The Mineral Resource is a local estimate, whereby the drill hole data was geologically domained above a nominated Fe(%) cut-off grade, resulting in fewer drill hole samples to interpolate the block model than the complete drill hole dataset, which would comprise a global estimate.</li> <li>Relevant tonnages and grade above a nominated cut-off grade are provided in the body of this report. Tonnages were calculated by filtering all blocks above the cut-off grade and sub-setting the resultant data into bins by deposit and classification. The volumes of all the collated blocks were multiplied by the dry density value to derive the tonnages. The Fe (%) metal value (g) for each block was calculated by multiplying the Fe grade (%) by the block tonnage. The total sum of all metal (g) for the deposit for the filtered blocks was divided by the total tonnage to derive the reportable Fe grade (%). The other elemental species mentioned in this table were similarly reported, based upon the DTR (%) reporting cut-off grade.</li> <li>The Mineral Resource is not a precise calculation of volumes and metal, rather it is an estimate based upon wide spaced sampling locations and implied (for Inferred Mineral Resources) geological and grade continuity. The Inferred Mineral Resource tonnages and grades reported here are an approximation and further geological testwork, by way of drilling, sampling and mapping, is required to increase the confidence levels of the Inferred Mineral Resources.</li> </ul>



Section 3 Estimation and Reporting of Mineral Resources – Moonshine and Moonshine North

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Measures taken to ensure that data has not been corrupted by, e.g. transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<ul style="list-style-type: none"> <li>Data used in the Mineral Resource estimate is sourced from relational database in MS Access format, maintained by Macarthur.</li> <li>Relevant tables from the data base are exported to MS Excel format and converted to csv format for import into Datamine software for use in the Mineral Resource estimate.</li> <li>Validation protocols for the data entered into the database are described in Section 1.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>The Competent Person (Mineral Resources) inspected the property on several occasions between 2008 and 2012. During each site visit, drilling operations and sampling procedures were inspected, proposed drill hole locations reviewed, geological outcrops were inspected, and geological and project discussions held with Macarthur staff.</li> <li>COVID 19 travel restrictions have prevented the Competent Person from visiting the project during 2020. When travel restrictions are lifted, the Competent Person will aim to conduct a site visit in conjunction with other technical staff during the preparation of the Moonshine BFS.</li> </ul>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</li> <li>Nature of the data used and of any assumptions made.</li> <li>The effect, if any, of alternative interpretations on Mineral Resource estimation.</li> <li>The use of geology in guiding and controlling Mineral Resource estimation.</li> <li>The factors affecting continuity both of grade and geology.</li> </ul>	<ul style="list-style-type: none"> <li>There is a reasonable to high level of confidence in the geological interpretation of the Moonshine and Moonshine North deposits, as reflected in the classification levels of the Mineral Resource. The confidence level is higher for the geometry of the mineralisation, and the true width, than for the depth of mineralisation.</li> <li>Geological interpretations were based upon geologically logged and chemically analyses drill hole samples and mapping of outcrop. A lower cut-off of 15% DTR or 30% head Fe was used to constrain the mineralisation domains. A highly siliceous zone in the footwall of the Moonshine deposit was domained out from the geological model, which also exhibited low levels of magnetite mineralisation.</li> <li>Geological factors such as strike and dip of the individual BIF lenses controlled the geometry of the mineralisation domains. Surface mapping of the BIF outcrops guided the geological interpretations.</li> <li>Mineralisation domains along strike and down dip were curtailed when the grade consistently fell below 30% Fe. The mineralised interpretation used for the estimates extends from the base of oxidation (at an average of approximately 65 m below surface) to the depth of the mineralised drill intersections ranging from approximately 200 m to 350 m below surface.</li> <li>A base of complete oxidation was modelled to constrain the reported Mineral Resource within the fresh rock zones only. This was guided by geological logging and sample assays.</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>The extent and variability of the Mineral Resource expressed as</li> </ul>	<ul style="list-style-type: none"> <li>The mineralisation extends along a strike extent of 7,000 m (Moonshine and Moonshine</li> </ul>





Criteria	JORC Code explanation	Commentary
	<p><i>length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</i></p>	<p>North).</p> <ul style="list-style-type: none"> <li>Mineralisation true widths vary from 10 m to 140 m. Depth of mineralization commences below the base of oxidation. The classified Mineral Resource extends between 200 m and 250 m below the base of oxidation.</li> <li>The mineralization is open at depth with the current drilling. For resource estimation the mineralisation has been constrained by geological knowledge, the available drilling and where appropriate, expected pit depths.</li> </ul>
<p><b>Estimation and modelling techniques</b></p>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i></li> <li><i>The assumptions made regarding recovery of by-products.</i></li> <li><i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i></li> <li><i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></li> <li><i>Any assumptions behind modelling of selective mining units.</i></li> <li><i>Any assumptions about correlation between variables.</i></li> <li><i>Description of how the geological interpretation was used to control the resource estimates.</i></li> <li><i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li><i>The process of validation, the checking process used, the comparison of model data to drillhole data, and use of reconciliation data if available.</i></li> </ul>	<ul style="list-style-type: none"> <li>Datamine Studio and Surpac software were used for geological modelling, block modelling, grade interpolation, Mineral Resource classification and reporting. GeoAccess Professional and Snowden Supervisor were used for geostatistical analyses of data. Mineralisation domains were based upon a lower cut-off of 30% head Fe or 15% DTR. Mineralisation domains were encapsulated by means of 3D wireframed envelopes. Domains were extrapolated along strike or down dip to half a section spacing or if a barren hole cut the down dip extension before this limit. Drill hole samples were composited to 5 m sample lengths, and statistical analyses for Fe(%), P(%), SiO<sub>2</sub>(%), Al<sub>2</sub>O<sub>3</sub>(%), LOI(%) and S(%) were carried out. Grade cutting was employed to ensure excessively high grades, for any of the grade variables, would not have an undue influence upon the grade interpolation by smearing high grades through the domains.</li> <li>A block model was created incorporating all the geological domains, with block sizes 25 m x 25 m x 10 m. Sub-celling of 2.5 m x 2.5 m x 1 m was used to ensure the domain volumes were adequately filled with blocks.</li> <li>Variograms were modelled for head grades for Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, MgO, P, S and LOI; and for concentrate grades for Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, MgO, P, S and LOI. A plunge to the mineralisation towards the southeast was modelled for all variograms. Low to moderate relative nugget effects were modelled for all grades, with short ranges of between 80 m and 110 m modelled, accommodating over half of the sample population variance.</li> <li>Kriging neighbourhood analysis (KNA) was carried out to assist with determining appropriate sample search and selection criteria.</li> <li>All RC and diamond drill hole data constrained within the mineralisation envelopes were utilised in the grade interpolation. Grade estimation was by OK with IDS estimation concurrently run as a check estimate. A minimum of 8 and maximum of 18 samples were used in any one block estimate. A maximum of 4 composited samples per drill hole were used in any one block estimate. Cell discretisation of 3 x 3 x 3 was used. Grade interpolation was run within the individual mineralisation domains, acting as hard boundaries. Search ellipsoid radii varied between the deposits, typically a primary search ellipse of 240 m along strike and down plunge, by 120 m down dip by 40 m across strike. Grades were interpolated into the parent cells.</li> <li>Datamine's Dynamic anisotropy functionality was used to control the orientation of the search ellipse, relative to the local orientation of the mineralisation domain.</li> </ul>



Criteria	JORC Code explanation	Commentary
		<ul style="list-style-type: none"> <li>Grade interpolation results were compared with previous Mineral Resource estimates and any anomalous differences were investigated.</li> <li>Head grades were estimated for Fe, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, P, MgO, LOI, S, CaO, K<sub>2</sub>O, MnO, Cr, TiO<sub>2</sub> and V. Concentrate grades were estimated for the same elements and oxides. The Mass Recovery percentage was also estimated using DTR results.</li> <li>Grades were also interpolated into the waste domains and the oxide zone of the mineralisation domains.</li> <li>No SMU assumptions were made.</li> <li>The grade models were validated by 1) creating slices of the model and comparing to drill holes on the same slice; 2) swath plots comparing average block grades with average sample grades on nominated easting, northing and RL slices; and 3) mean grades per domain for estimated blocks and flagged drill hole samples. No mining has taken place therefore no reconciliation data was available.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</li> </ul>	<ul style="list-style-type: none"> <li>Tonnages are estimated on a dry basis.</li> </ul>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>The basis of the adopted cut-off grade(s) or quality parameters applied.</li> </ul>	<ul style="list-style-type: none"> <li>The Mineral Resources are quoted from blocks above 15% DTR. This cut-off grade is also the domain cut-off. The DTR cut-off is required to ensure a higher volume of magnetite bearing mineralisation is selected, removing the rock volumes with low magnetite content.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Mineralisation outcrops at surface and was modelled to a depth to which open pit mining would operate. No assumptions have been made to date regarding minimum mining widths or dilution controlling the Mineral Resource estimates.</li> </ul>
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Metallurgical test work was considered sufficient to support a Preliminary Economic Assessment (2019) for the Moonshine deposit.</li> <li>A metallurgical sample was prepared using drill samples from two RC holes, one located in Moonshine and the other in Moonshine North. The DTR and head Fe grades from the samples are higher than the average grades and recoveries of surrounding samples.</li> <li>The Low Intensity Magnetic Separators (LIMS) test results yielded a poorer quality concentrate than was determined from the DTR preliminary analysis. The reason for this is unknown and will be investigated further during the proposed BFS.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental factors and assumptions have been examined as part of the PFS for the Ularring Hematite Project, overlapping or immediately adjacent to the Lake Giles Magnetite Project. The Ularring Hematite Project has received State and Commonwealth environmental approvals. Additional environmental surveys are required over areas of the magnetite deposits that are not included in the environmental approvals for the Ularring Hematite Project. The Company is not aware of any significant environmental reasons why approval is unlikely to be granted for the Lake Giles Magnetite Project.</li> </ul>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</li> </ul>	<ul style="list-style-type: none"> <li>A total of 624 drill samples were captured within the mineralisation domains and statistically assessed to determine the mean and data ranges, and to see if any excessively low or high SG values were present. Three mineralisation domains contain SG data. A further 400 samples were taken from the BIF oxide zones, or the footwall and hangingwall waste zones. Core samples were sealed prior to immersion in water. A conventional Archimedes wet/dry weighing was used to measure density.</li> <li>Density was determined by way of algorithms comparing head Fe versus the measured SG values from diamond core billets, from the domained data. <ul style="list-style-type: none"> <li>For main Moonshine zone, <math>DENSITY = (0.0241 * FE) + 2.624</math></li> <li>For eastern Moonshine, <math>DENSITY = (0.0293 * FE) + 2.492</math></li> <li>For Moonshine North, <math>DENSITY = (0.0295 * FE) + 2.468</math></li> <li>Where FE is the estimated block grade.</li> </ul> </li> <li>The Moonshine northeast zones used the Moonshine North algorithm</li> <li>Algorithms were developed for the other non-mineralised domains.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Classification</b>	<ul style="list-style-type: none"> <li>• <i>The basis for the classification of the Mineral Resources into varying confidence categories.</i></li> <li>• <i>Whether appropriate account has been taken of all relevant factors (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).</i></li> <li>• <i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Classification of the Mineral Resource estimates was carried out taking into account the geological understanding of the deposit, QAQC of the samples, density data and drill hole spacing.</li> <li>• The Measured Mineral Resources were based upon a confirmed understanding of the geological and grade continuity. Drill spacing is typically 25 m along the northerly strike, with often 2 to 3 holes per section. The Measured volumes also contain samples which were subject to DTR test work, with associated assays from the recovered concentrates. SG measurements were also available.</li> <li>• The Indicated Mineral Resources were based upon an assumed understanding of the geological and grade continuity. Drill spacing is typically 25 – 50/100 m along the northerly strike, with at least one hole per section. The Indicated volumes also contain samples subject to DTR test work, with associated assays from the recovered concentrates. SG measurements may also be available.</li> <li>• The Inferred Mineral Resources were based upon an implied understanding of the geological and grade continuity. Some mineralisation domains are only cut by one drill hole, and the geological models are strongly guided by surface mapping of the BIF outcrops. Drill spacing is typically <math>\geq 100</math> m along the northerly strike. DTR and SG results are generally absent from within the Inferred volumes.</li> <li>• All available data was assessed and the Competent Persons relative confidence in the data was used to assist in the classification of the Mineral Resource.</li> <li>• The current classification assignment appropriately reflects the Competent Person's view of the deposit.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of Mineral Resource estimates.</i></li> </ul>	<ul style="list-style-type: none"> <li>• No independent audit of the Mineral Resources has been conducted. Alternate CSA Global resource geologists reviewed the Mineral Resource estimates prior to release of the results to Macarthur Minerals, as part of CSA Global's procedures.</li> </ul>
<b>Discussion of relative accuracy/ confidence</b>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• No other estimation method or geostatistical analysis has been performed.</li> <li>• The Mineral Resource is a local estimate, whereby the drill hole data was geologically domained above a nominated Fe(%) cut-off grade, resulting in fewer drill hole samples to interpolate the block model than the complete drill hole dataset, which would comprise a global estimate.</li> <li>• Relevant tonnages and grade above a nominated cut-off grade are provided in the body of this report. Tonnages were calculated by filtering all blocks above the cut-off grade and sub-setting the resultant data into bins by deposit and classification. The volumes of all the collated blocks were multiplied by the dry density value to derive the tonnages. The Fe (%) metal value (g) for each block was calculated by multiplying the Fe grade (%) by the block tonnage. The total sum</li> </ul>



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	<ul style="list-style-type: none"> <li>• <i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<p>of all metal (g) for the deposit for the filtered blocks was divided by the total tonnage to derive the reportable Fe grade (%). The other elemental species mentioned in this table were similarly reported, based upon the Fe (%) reporting cut-off grade.</p> <ul style="list-style-type: none"> <li>• The Mineral Resource is not a precise calculation of volumes and metal, rather it is an estimate based upon relatively wide spaced sampling locations. The Inferred Mineral Resource tonnages and grades reported here are an approximation and further geological testwork, by way of drilling, sampling and mapping, is required to increase confidence levels.</li> </ul>