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NI 43-101 TECHNICAL REPORT

on the

Magnetite Mineral Resource, Lake Giles Magnetite Project, Western Australia

PREPARED FOR: Macarthur Minerals Limited

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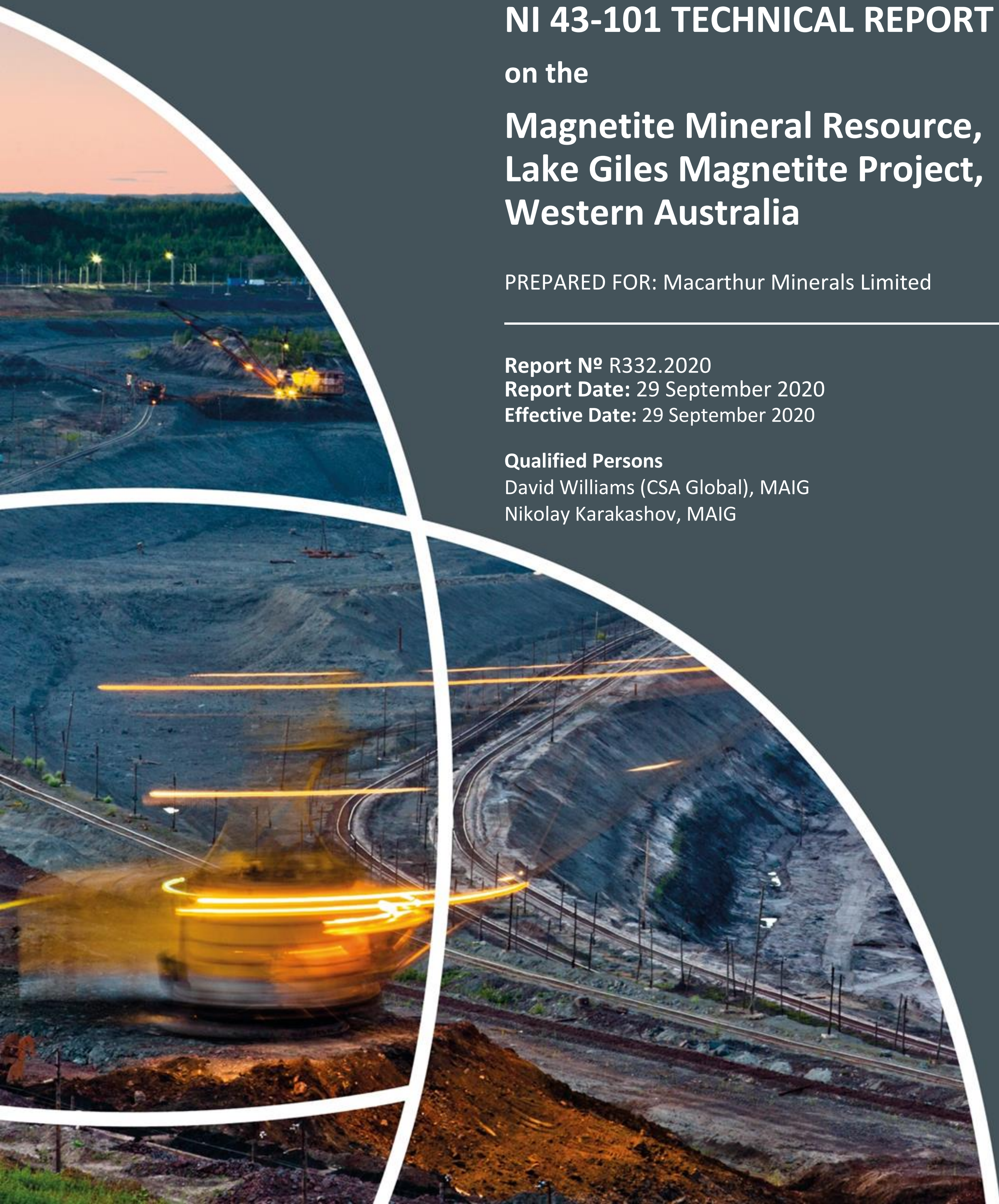

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Certificate of Qualified Person – David Williams

As a Qualified Person and a co-author of the technical report titled: "NI 43-101 Technical Report on the Magnetite Mineral Resource, Lake Giles Magnetite Project, Western Australia" for Macarthur Minerals Limited, with Effective Date of 29 September 2020 (the "Technical Report"), I, David Williams do hereby certify that:

1. I am a Principal Resource Geologist with CSA Global Pty at its Queensland office located at Level 2, 201 Leichhardt Street, Spring Hill, Queensland, Australia.
2. I am a professional geologist having graduated with a B.Sc. (Hons) in Geology from the University of Adelaide (1990).
3. I am a Member of the Australian Institute of Geoscientists (member # 4176).
4. I have practised my profession as a geologist for the past 30 years in the mineral resources sector and engaged in the assessment, development, and operation of mineral projects both within Australia and internationally.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I have authored and take responsibility for Items 1, 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 18, and 19 of the Technical Report.
7. I have not conducted a recent and current site inspection.
8. I am independent of the Issuer as described in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I visited the Project on several occasions between 2010 and 2012 and participated in the planning of drillholes in 2019.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that Instrument and Form.
11. As of the Effective Date of the Technical Report, to the best of my knowledge, information, and belief, contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 29th September 2020 at Spring Hill, Queensland, Australia

["SIGNED"]
{David Williams}

David Williams, B.Sc. (Hons), MAIG
Principal Resource Geologist
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Certificate of Qualified Person – Nikolay Karakashov

As a Qualified Person and a co-author of the technical report titled: "NI 43-101 Technical Report on the Magnetite Mineral Resource, Lake Giles Magnetite Project, Western Australia" for Macarthur Minerals Limited, with Effective Date of 29 September 2020 (the "Technical Report"), I, Nikolay Karakashov do hereby certify that:

1. I am a Consultant Geologist from 25 Marlborough Street, Perth, Western Australia, Australia.
2. I am a professional geologist having graduated with a M.Sci. (Hons) in Geology and Geophysics from Imperial College London's Royal School of Mines (2009).
3. I am a Member of the Australian Institute of Geoscientists (member # 6237).
4. I have practised my profession as a geologist for the past 10 years in the mineral resources sector and engaged in the assessment, development, and operation of mineral projects both within Australia and internationally.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I have authored and take responsibility for Items 7, 8, 9, 10, 11, and 12 of the Technical Report.
7. I visited the Lake Giles Magnetite Project on 9–10 September 2020.
8. I am independent of the issuer as described in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report through reverses circulation and diamond exploration drilling between 2010 and 2011 at the Moonshine and Moonshine North prospects.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that Instrument and Form.
11. As of the Effective Date of the Technical Report, to the best of my knowledge, information, and belief, contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 29th September 2020 at Perth, Western Australia, Australia

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1 Summary

1.1 Project

The Lake Giles Magnetite Project ("Project") is located approximately 150 km northwest of the town of Kalgoorlie in the state of Western Australia (Figure 1). The Project is owned by Macarthur Iron Ore Pty Ltd (MIO), a 100% owned subsidiary of Macarthur Minerals Limited ("Macarthur" or "the Company" or "the Issuer").

The Project consists of a series of banded iron formation (BIF) hematite and magnetite prospects. This report covers the mineral resources of the magnetite mineralisation of the Snark, Clark Hill North, Clark Hill South, Sandalwood and Moonshine deposits.

The mineral resources of the Project were previously reported in 2009 (CSA, 2009) and 2011 (Fieldgate et al., 2011).

The Mineral Resources reported herein have been updated to incorporate recent infill drilling at the Moonshine and Moonshine North deposits. Previously reported resource estimates of the Snark, Clark Hill North, Clark Hill South and Sandalwood deposits have been reviewed and reported in accordance with current Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards.

1.2 Company Strategy

Macarthur is an Australian public company listed on the Toronto Stock Exchange (TSX-V: MMS) and the Australian Securities Exchange (ASX: MIO) and commenced exploration in 2006 for magnetite iron resources and subsequently hematite iron resources on its Lake Giles tenements in Western Australia.

In 2009, the Company reported Inferred Mineral Resources of 1,316 million tonnes of magnetite at a 15% Davis Tube Recovery (DTR) cut-off (Allen, 2009) and updated the Mineral Resource estimate in 2011 (Fieldgate et al., 2011). Macarthur is now focused on completing further engineering and mining studies on the Moonshine magnetite deposits.

1.3 Property Description, Location, Permitting and Infrastructure

The Lake Giles Magnetite Project is located about 450 km east-northeast of the coastal city of Perth, Western Australia (Figure 1). Macarthur manages 15 contiguous tenements covering a total area of 62 km^2. The tenements are granted Mining Leases and 100% held by Macarthur Iron Ore Pty Ltd (MIO), a 100% owned subsidiary of Macarthur.

The Project comprises hematite/goethite and magnetite mineralisation located within these tenements.

Figure 1: Location plan – Lake Giles Magnetite Project
Source: Macarthur (2020)

1.3.1 Permitting and Native Title Claims

The Project does not have any environmental liabilities from previous mining or exploration activities such as the rehabilitation of waste dumps or decommissioning of tailings storage facilities. No area of the site is registered as a contaminated site that requires remediation. Macarthur has not been fined or prosecuted under any environmental legislation or received any improvement notices for current or past exploration activities from the Western Australian Department of Mines, Industry Regulation and Safety (DMIRS).

The main legislation that governs environmental protection at the Federal level is the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (NES). Matters of NES have been identified within the Project area.

The primary legislation for environmental protection in Western Australia is the *Environmental Protection Act 1986* (EP Act). With regards to mining approvals, projects may require assessment under two separate parts; Part IV and Part V, administered by the Environmental Protection Authority (EPA) and the Department of Water and Environment Regulation, respectively. Under Part IV of the Act, Proposals are referred to the EPA for a decision on whether the project has the potential to cause significant impacts on the environment.

Macarthur will need to undertake an environmental impact assessment in order to obtain environmental approval for development. The Company is not aware of any major environmental obstacles that would prevent approval of the Lake Giles Magnetite Project.

The Project sits within the Marlinyu Ghoorlie native title claim. The claim was registered on 28 March 2019 and is currently not determined. Native title rights in registration or grant give claimants the right to negotiate during the grant of mineral tenure. Macarthur's mining leases were all granted prior to registration of the Native Title claim and the current claim does not confer rights to negotiate or affect the tenure. There were no native title claims over the area at the time of grant and therefore no access agreements were required to be negotiated with claimants.

1.3.2 Infrastructure

Site infrastructure is limited to an exploration camp and graded and ungraded site tracks. No mining activities have taken place to date.

The Project is located approximately 250 km by road from the regional centre of Kalgoorlie-Boulder, a city servicing many local gold and nickel mines throughout the Eastern Goldfields region of Western Australia. The Project is also located within 90 km of an open access rail line owned by Arc Infrastructure. The rail runs for approximately 500 km direct to the Port of Esperance that has facilities for iron mineralisation handling, storage and export.

1.4 Property History

1.4.1 Property Ownership

Since the late 1960s, several exploration companies have held the exploration rights to the project tenements prior to Macarthur acquiring the rights to the tenements in 2005. There have been three main phases of exploration; nickel exploration from 1968 to 1972, gold exploration from 1993 to 2004 and more recently iron exploration.

1.4.2 Previous Mineral Resource Estimates and Previous Mining

There are no known historical mineral resource or reserve estimates prior to 2007 for any commodity within the area now covered by the tenements.

Mineral Resources for the Lake Giles Magnetite Project were reported between 2007 and 2011 as detailed in Table 1. The Mineral Resources were classified and reported in accordance with 2005 CIM Definition Standards for Mineral Resources and Mineral Reserves and have been superseded by the Mineral Resource estimate reported in Table 2 and Table 3.

The Issuer is not treating the previous Mineral Resource estimates as current Mineral Resources. These previous Mineral Resource estimates are presented for historical information and context only. Current Mineral Resource estimates are presented in Section 14 of this Report.

Table 1: Previous Mineral Resource estimates

Deposit	Hellman & Schofield						CSA Global		Snowden	
	2007		2008		2009		2009–2010		2011	
	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %
Snark	26.3	27.5	26.3	27.5	26.3	27.5	75	27.7	-	-
Clark Hill North	7.7	32.5	37.1	26.0	37.1	26.0	130.0	25.8	-	-
Clark Hill South	48.5	21.9	48.5	21.9	48.5	21.9	66	30.3	-	-
Sandalwood	-	-	84.7	28.3	84.7	28.3	335.0	31.1	-	-
Moonshine	-	-	-	-	144.1	25.9	510.9	27.8	710.5	30.2

No mining is known to have been undertaken in the Project area or anywhere on the tenements to date.

1.5 Project Exploration

Macarthur took over the tenements in late 2005 with the purchase of Internickel Pty Ltd. Macarthur immediately continued with the ongoing exploration program for nickel and gold. In particular, anomalies generated by a 2004 helicopter electromagnetic survey (HoistEM) were visited and many were mapped and sampled, with emphasis on the search for nickel bearing gossans.

Iron mineralisation associated exploration activities commissioned by Macarthur at the Project area since 2005 includes geological and geomorphological mapping and geophysics, including air and ground magnetic anomaly, ground gravity, rock chip, auger and regional soil sampling, in conjunction with drilling.

Early drilling between 2006 and 2009 delineated Mineral Resources at Moonshine, Moonshine North, Snark, Clark Hill North and South, and Sandalwood, with a number of geophysical surveys including ground gravity and magnetics as well as detailed outcrop mapping occurring in the same period.

From 2010, exploration mostly concentrated on Moonshine and Moonshine North as the two prospects showed the greatest potential and highest quality of resource as exploration targets. Both prospects were drilled in three main campaigns in 2010, 2011 and 2019 with minor drilling in between. Other means of exploration during this period included further detailed outcrop mapping, a geomorphological survey covering the project area as well as regional soil sampling campaigns.

In 2011, a light detection and ranging (LiDAR) survey was conducted over the entire project area, from which a high-resolution digital terrain model (DTM) was produced, as well as composite imagery useful in environmental assessments and visual geological data.

All drilling between 2009 and 2013 included downhole surveying as well as structural data for selected holes.

1.6 Metallurgical Testwork

Metallurgical testwork has been performed by Promet (2008) using chips from 14 reverse circulation (RC) holes drilled at the Clark Hill North, Clark Hill South, and Snark deposits.

An Industry benchmark for Blast Furnace grade magnetite concentrate is for the silica grade to be <5%. A reverse flotation test indicates a magnetite concentrate of less than 5% SiO_2 can be achieved at a 25-micron grind at a product weight recovery of 65% (Promet, 2008).

A second stage of metallurgical testwork was conducted by Engenium (2011) using samples from two RC holes drilled at the Moonshine and Moonshine North deposits. Testwork involved development of a grind procedure and a program of Low Intensity Magnetic Separation to produce a magnetite concentrate. The results show that the composite sample from one hole could produce a suitable magnetite concentrate, recovering about 88% of the iron, at a size passing a 45 microns screen. The other composite sample required a grind to 25 microns to achieve a concentrate with <5% SiO_2.

1.7 Mineral Resource Estimate

1.7.1 Summary

The magnetite Mineral Resource estimates completed by Qualified Person (QP) Mr David Williams for the Moonshine and Moonshine North deposits are presented in Table 2. Mineral Resource estimates for the Sandalwood, Snark, Clark Hill North, and Clark Hill South deposits are presented in Table 3. Mineral Resources are reported above a DTR cut-off of 15%. The Mineral Resources are not believed to be materially affected by any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors.

Mineral Resources have been reported in accordance with CIM Definition Standards for Mineral Resources and Reserves dated 10 May 2014 (2014 CIM Definition Standards) (CIM, 2014). The QP has undertaken a review of sample assays, drilling data, data validation, quality assurance/quality control (QAQC), estimation parameters, material density, block model parameters and classification procedures. The following information summarises the steps and procedures taken, and data reviewed by the QP to ensure Mineral Resource estimates are reported in accordance with 2014 CIM Definition Standards.

Table 2: Mineral Resource estimate – Moonshine and Moonshine North, where DTR >15%

Category	Tonnes (Mt)	Head grade (%)					Concentrate grade (%)					
		Fe	P	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	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
Subtotal	**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

**Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*

Table 3: Mineral Resource estimate – Sandalwood, Clark Hill North, Clark Hill South and Snark, where DTR >15%

Deposit	Category	Tonnes (Mt)	Head grade (%)				Concentrate grade (%)					
			Fe	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	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

Notes:

- *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*
- *The Mineral Resource estimate was prepared by David Williams, B.Sc., MAIG, a CSA Global employee, and the QP for the estimate.*
- *Mineral Resources were estimated using Datamine Studio RM (Version 1.6.87).*
- *Assays were composited to regular 1 m or 5 m intervals, dependent upon the deposit.*
- *Composite assay grades were capped as required. Fe and DTR grades were not capped.*
- *Block-model grade interpolation was undertaken using ordinary kriging.*
- *Bulk density was calculated for each block in the Moonshine model using algorithms, based upon the estimated Head Fe block grade. Average bulk density of 3.3 t/m^3 was applied to the other deposit models.*
- *Mineral Resources are reported from a model with parent block dimensions of 25 m x 25 m x 10 m.*
- *Tonnage and grade have been rounded to reflect the relative accuracy of the Mineral Resource estimate; therefore, columns may not total due to rounding.*
- *Resource classification is as defined by the CIM in its document "CIM Definition Standards for Mineral Resources and Mineral Reserves" of 10 May 2014.*
- *The QP and Macarthur are not aware of any current environmental, permitting, legal, title, taxation, socio-economic, marketing or political factors that might materially affect these Mineral Resource estimates.*

1.7.2 Mineral Resource Estimation

The outcropping geology of the project area is comprised of a combination of un-altered silica-rich 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 with elevated iron and decreased silica grades, near surface. These enriched bands vary from 10 m to 150 m in true thickness and are steeply dipping at 70–90°. The outcrop of weathered iron mineralisation is indicative of the fresh (non-weathered) magnetite mineralisation located down dip which is favourable for hosting a Mineral Resource.

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 to be in excess of 250 m below surface as demonstrated by results from several drillholes, confirming a consistent easterly dip of the hangingwall for the majority of the Moonshine and Moonshine North prospects.

The Lake Giles magnetite deposits were drilled with RC and 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 drillhole database. There are no significant risks or uncertainties that have been identified in the exploration data or programs.

Macarthur provided the geological and mineralisation interpretations to CSA Global Pty Ltd (CSA Global), an ERM Group company, as three-dimensional (3D) wireframe solids and surfaces. The drillhole 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) x 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 eight and maximum of 18 samples were used in any one block estimate, with a maximum of four samples per drillhole. Search ellipsoid radii varied between the deposits. Typically, a primary search ellipse of 240 m along strike and down plunge x 120 m down dip x 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 bulk density 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 bulk density values were present. Three mineralisation domains contain bulk density data. A further 400 samples were taken from the BIF oxide zones, or the footwall and hangingwall waste zones. Core samples, both from the fresh and oxidised zones, were highly competent, without any fractures or voids, and were not required to be wax 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 iron grade from assays, and the corresponding bulk density 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 bulk density value of 3.3 t/m^3, which is a typical density value for the style of mineralisation.

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 two to three holes per section. The Measured volumes also contain samples subject to DTR testwork, with associated assays from the recovered concentrates. Bulk density 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 testwork, with associated assays from the recovered concentrates. Bulk density 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 drillhole, and the geological models are strongly guided by surface mapping of the BIF outcrops. Drill spacing is typically ≥100 m along the northerly strike. DTR and bulk density 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 testwork results to support the reporting of concentrate grade estimates.

1.8 Conclusions and Recommendations

The QP provides the following conclusions and recommendations pertaining to Mineral Resource estimates for the Lake Giles Magnetite Project.

1.8.1 Conclusions

A Mineral Resource estimate has been prepared for the Lake Giles Magnetite Project, based upon a total of 359 RC drillholes and 14 diamond holes. Results from these drillholes, and from geological field mapping and observations, provided the basis for the geological interpretations. Macarthur provided the geological and mineralisation interpretations to CSA Global as 3D wireframe solids and surfaces. CSA Global flagged the drillhole samples 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.

3D block models representing the mineralisation was created using Datamine software. High quality diamond and RC drillhole samples were used to interpolate head and concentrate grades into the block model using ordinary kriging. The block models were validated visually and statistically.

Mineral Resources are reported for the Moonshine, Moonshine North, Sandalwood, Clark Hill North, Clark Hill South, and Snark magnetite deposits. The Mineral Resource estimates are classified as a combination of Measured, Indicated and Inferred, in accordance with 2014 CIM Definition Standards. The classification level is based upon an assessment of the geological understanding of the deposit, QAQC of the samples, mass recovery results, density data and drillhole spacing.

1.8.2 Recommendations

CSA Global recommend the following actions be completed to support the ongoing exploration and evaluation effort at the Lake Giles Magnetite Project:

- Continue to develop a deposit scale geological model incorporating lithology, mineralisation, weathering and structural features that locally control the occurrence and location of BIF host rock.
- Consider domaining a zone exhibiting higher magnetite concentration, and lower SiO_2 levels, for future Mineral Resource estimates. The domain would need to exhibit sufficient strike and down dip extent to be justified for future use.
- Maintain field geological procedures with respect to drill rig inspections and sampling procedures, vetting the maintenance and cleanliness of sample splitters and sample recovery.

- Monitor the performance of certified reference materials (CRM) and field duplicates immediately upon receipt of assays.
- Macarthur geologists to compile a QAQC report prior to future Mineral Resource estimates.
- Merge the drillhole databases containing the pre-2019 and 2019 drill data.
- Complete additional drilling in Indicated and Inferred Mineral Resource areas to increase geological confidence of individual mineralised units.

Future exploration work would initially proceed with one phase of work, focusing on infill drilling to increase the confidence in the Mineral Resources within areas currently classified as Indicated or Inferred. An update to the Mineral Resource estimate would follow, irrespective of the impact the drill results would have on the Mineral Resource. A budget of A$730,000 is proposed for this work.

2 Introduction

2.1 Issuer

This Technical Report has been prepared for Macarthur Minerals Limited ("Macarthur" or "the Issuer") by independent geological consultants, CSA Global Pty Ltd (CSA Global), an ERM Group company.

Macarthur is an Australian public company listed on the TSX Venture Exchange (TSX-V: MMS) and the Australian Securities Exchange (ASX: MIO). The Company is incorporated in Australia and registered in Queensland. Macarthur owns the Lake Giles Magnetite Project through its 100% owned subsidiary, Macarthur Iron Ore Pty Ltd.

2.2 Terms of Reference

Macarthur commissioned CSA Global to prepare a Mineral Resource estimate for the Moonshine, Moonshine North, Snark, Clark Hill North, Clark Hill South, and Sandalwood magnetite deposits at Macarthur's Lake Giles Magnetite Project located in Western Australia.

This Technical Report discloses material changes to the Property including an updated Mineral Resource estimate for the Moonshine and Moonshine North deposits.

The report is specific to the standards dictated by National Instrument 43-101 (NI 43-101) (30 June 2011), companion policy NI 43-101CP, and Form 43-101F1 (Standards of Disclosure for Mineral Projects). The Mineral Resource estimates reported in this Technical Report have been prepared in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014) (2014 CIM Definitions and Standards). Only Mineral Resources are estimated – no Mineral Reserves are defined. The report is intended to enable the Issuer to reach informed decisions with respect to the Project.

The Issuer reviewed draft copies of this report for factual errors. Any changes made because of these reviews did not include alterations to the interpretations and conclusions made. Therefore, the statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this report.

2.2.1 Independence

Neither CSA Global, nor the authors of this report, has any material present or contingent interest in the outcome of this report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence in the preparation of this report. The report has been prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report. No member or employee of CSA Global is, or is intended to be, a director, officer or other direct employee of Macarthur.

2.3 Sources of Information

This report is based primarily on the information sources listed as references in Section 19. The Mineral Resource estimates were completed by Mr David Williams of CSA Global based on the technical data provided by Macarthur and its consultants.

2.4 Qualified Persons

The QPs have prepared or supervised the preparation of each section as presented in Table 4.

Table 4: Technical Report items and responsible authors

Section	Section title	Responsible author
1	Summary	All authors
2	Introduction	David Williams
3	Reliance on Other Experts	David Williams
4	Property Description and Location	David Williams
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography	David Williams
6	History	David Williams
7	Geological Setting and Mineralisation	Nikolay Karakashov
8	Deposit Types	Nikolay Karakashov
9	Exploration	Nikolay Karakashov
10	Drilling	Nikolay Karakashov
11	Sample Preparation, Analysis and Security	Nikolay Karakashov
12	Data Verification	Nikolay Karakashov
13	Mineral Processing and Metallurgical Testing	David Williams
14	Mineral Resource Estimates	David Williams
15	Adjacent Properties	David Williams
16	Other Relevant Data and Information	David Williams
17	Interpretations and Conclusions	David Williams
18	Recommendations	David Williams
19	References	David Williams

The authors are QPs with the relevant experience, education and professional standing for the sections of the report for which they are responsible.

2.5 Qualified Person Property Inspection

Mr Nikolay Karakashov, Consultant Geologist, visited the property on 9–10 September 2020. The authors consider Mr Karakashov's site visit current under Section 6.2 of NI 43-101. While on site, Mr Karakashov inspected the overall geology of the project including outcropping magnetite mineralisation of the Moonshine, Moonshine North, Sandalwood, Clark Hill North, Clark Hill South, and Snark deposits. Representative drill core and RC chips of mineralised intervals from the deposits were inspected. Multiple drillhole locations were visited and collar coordinates for 28 drillholes were surveyed with a handheld Garmin global positioning system (GPS) device, with an accuracy of ± 3 m on the GDA94 grid system. In all cases, the surveyed collar coordinates were confirmed.

There were no negative outcomes from the site inspection. Further discussion on the site inspection is provided in Section 12.1.

Mr David Williams, CSA Global Principal Resource Geologist, could not complete a current site inspection due to domestic travel restrictions decreed by the Western Australian Government as a result of the COVID-19 pandemic. Mr Williams previously visited the Project on several occasions between 2010 and 2012, where he observed drilling and sampling procedures in progress at the time, inspected BIF outcrop, and held discussions with the Macarthur staff regarding the geology of the deposits, and potential future development of the Project.

3 Reliance on Other Experts

No reliance on other experts who are not QPs was made in the preparation of this report other than outlined below.

The QPs have relied upon and disclaims responsibility for information provided by the Issuer concerning legal and environmental matters relevant to the Technical Report in a document titled "Lake Giles Magnetite Project – Tenure & Environment", dated 1 September 2020 authored by Dr Dean Carter, General Manager, Macarthur Minerals.

The QPs have not independently verified the legal status, ownership of the properties described in Sections 4.2 and 4.3.and rely upon the above cited document. The Property description presented in this report is not intended to represent a legal, or any other opinion as to title.

Mr Williams has relied on information regarding environmental impacts, approval status and native title rights in the above cited document with respect to Section 4.3.

4 Property Description and Location

4.1 Location of Property

The Lake Giles Magnetite Project is located approximately 450 km east-northeast from the coastal city of Perth and 175 km northwest from the historic gold mining town of Kalgoorlie-Boulder, in the state of Western Australia (Figure 1 and Figure 2).

Unless otherwise stated, all coordinates referenced in this report are in Geocentric Datum of Australia (GDA 94, Zone 50). The Project tenements are centred at approximately 788,000 mE and 6,687,000 mN.

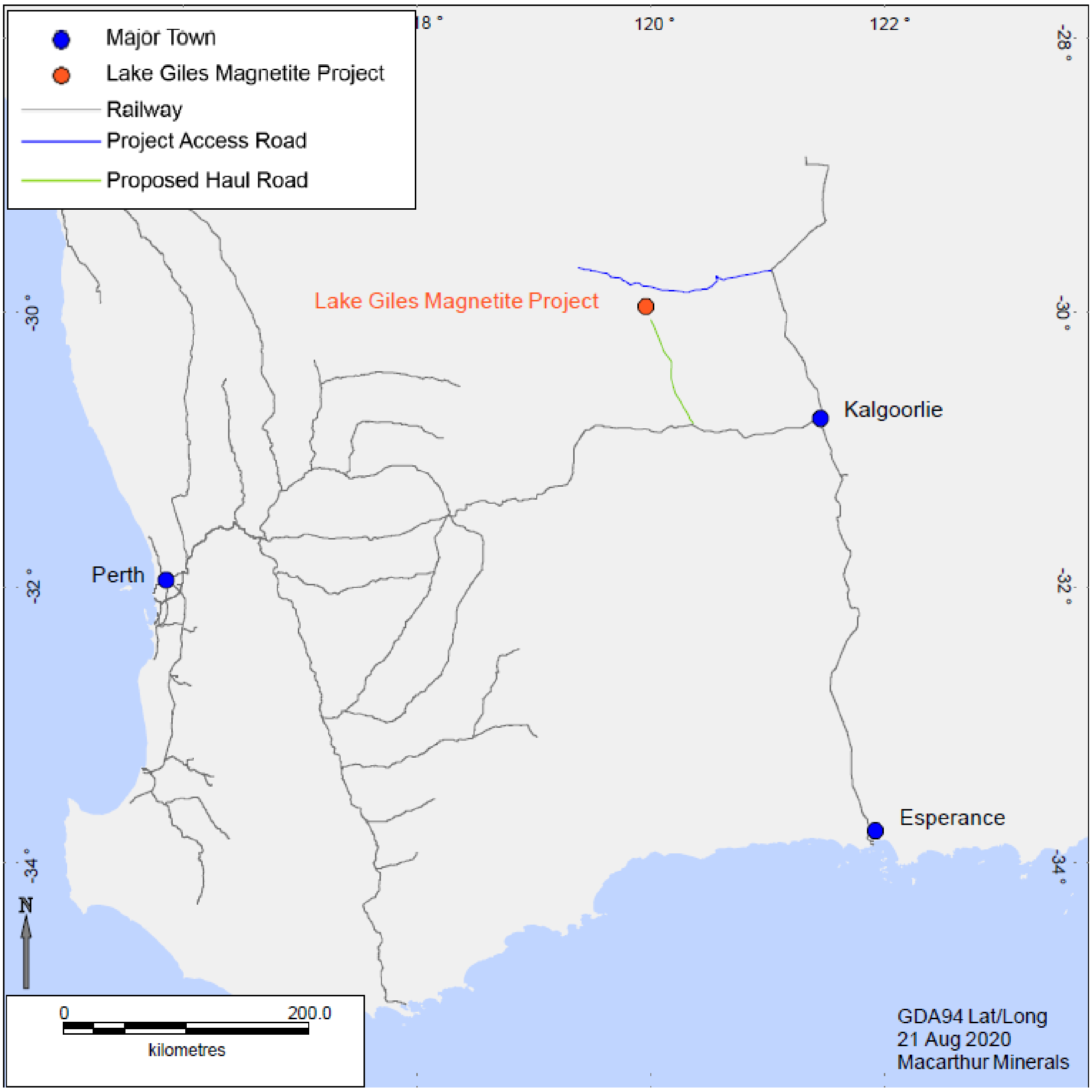

Figure 2: Location of the project area with local infrastructure and localities
Source: Macarthur (2020)

4.2 Details of Tenure

At present Macarthur manages 15 granted mining leases covering a total area of approximately 6,256 ha (Figure 3). All tenements are 100% controlled by Macarthur Iron Ore Pty Ltd (MIO), a 100% owned subsidiary of Macarthur as itemised in Table 5 and Figure 3.

Mining lease boundaries are defined by the location of corner claim pegs with approximate coordinates based on GPS readings recorded in claim documentation. They must be accurately surveyed by an Approved Surveyor after the lease is granted.

To maintain the mining leases in good standing, Macarthur is required to file a certain amount of exploration expenditure. All the mining leases (Figure 3, Table 5) are in good standing with expenditure commitments being kept up to date.

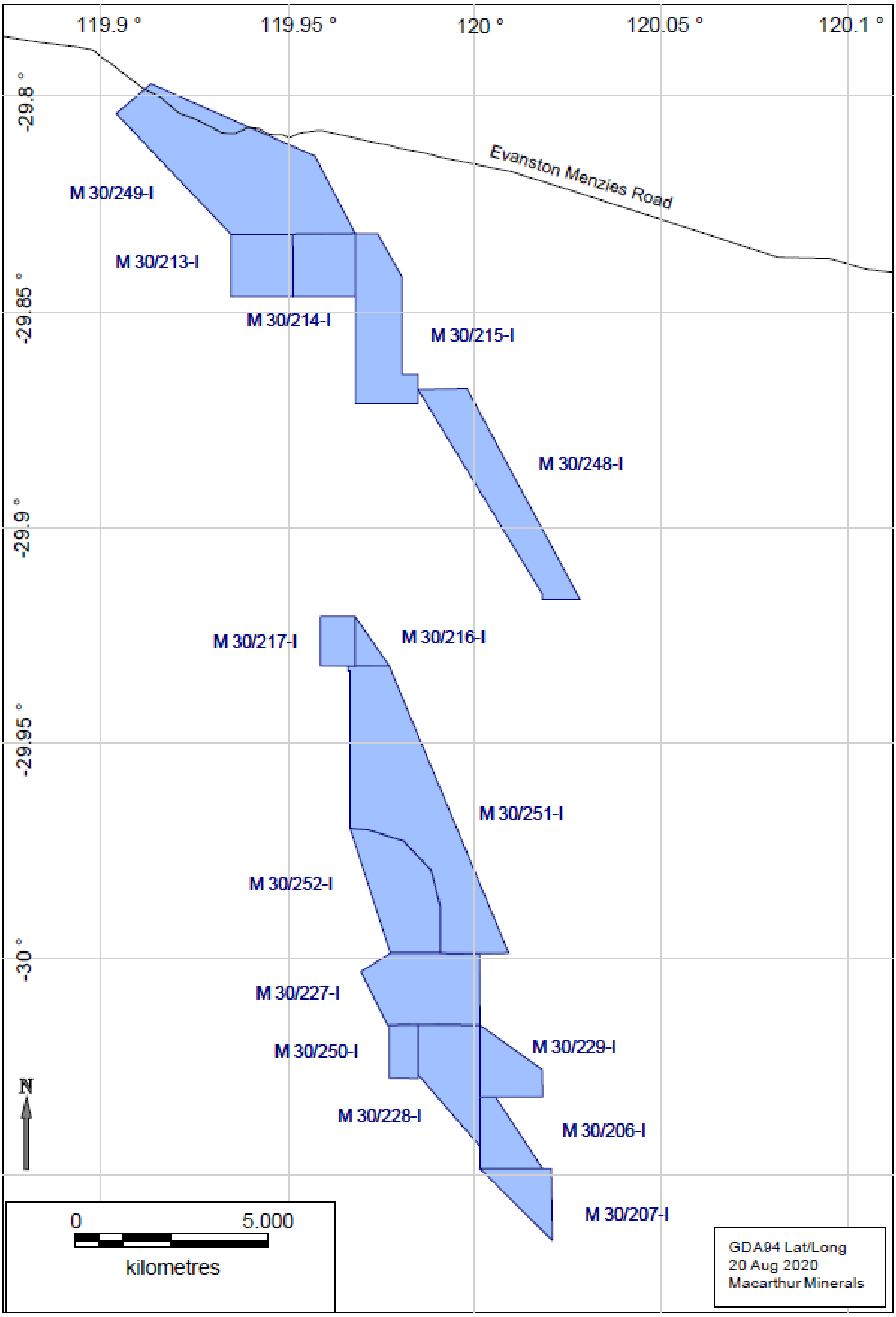

Figure 3: Macarthur tenement holdings at August 2020
Source: Macarthur (2020)

Table 5: MIO tenure details and expenditure commitments as of 13 August 2020

Tenement ID	Holder	Area (ha)	Grant Date	Expiry date	Annual expenditure commitment (A$)
M30/0206	MIO	189	02/07/2007	01/07/2028	$18,900
M30/0207	MIO	171	02/07/2007	01/07/2028	$17,100
M30/0213	MIO	258	13/06/2011	12/06/2032	$25,800
M30/0214	MIO	260	13/06/2011	12/06/2032	$26,000
M30/0215	MIO	521	13/06/2011	12/06/2032	$52,100
M30/0216	MIO	55	13/06/2011	12/06/2032	$10,000
M30/0217	MIO	114	13/06/2011	12/06/2032	$11,400
M30/0227	MIO	504	13/06/2011	12/06/2032	$50,400
M30/0228	MIO	362	02/07/2007	01/07/2028	$36,200
M30/0229	MIO	205	02/07/2007	01/07/2028	$20,500
M30/0248	MIO	585	22/02/2012	21/02/2033	$58,500
M30/0249	MIO	1206	22/02/2012	21/02/2033	$120,600
M30/0250	MIO	102	05/03/2013	04/03/2034	$10,200
M30/0251	MIO	1246	27/11/2012	26/11/2033	$124,600
M30/0252	MIO	478	27/05/2013	26/05/2034	$47,800

4.3 Tenure Conditions and Liabilities

Macarthur's tenements occur on vacant Crown Land which is defined as Crown Land not currently being used or reserved for any future purpose. As the registered tenement manager, Macarthur has the right to access the land for the purpose of mineral exploration, subject to the conditions of tenure described below (Table 6).

The tenements are not subject to any royalty agreements or encumbrances other than described below.

Macarthur undertook a Convertible Note raise for US$6 million in mid-2019. The Convertible Notes were secured against the mining leases held by Macarthur Iron Ore Pty Ltd. As of 4 September 2020, all remaining Convertible Note holders have elected to convert their Notes into common shares in the Company. Following the conversion of all the Convertible Notes, Macarthur is now moving through the process with all converting Noteholders to remove the Noteholders as beneficiaries under the General Security Agreement and to discharge the securities over the tenements. The Company expects this process to be completed within the next several weeks.

There are no heritage agreements in place as the tenements were granted prior to the current native title claim. There are no other known significant risks that could affect access, title or the right to perform work on the tenements. All exploration activity is conducted according to the tenure conditions as listed below, including the requirement to obtain Program of Works (POW) approvals before any drilling is undertaken.

The project does not have any environmental liabilities from previous mining or exploration activities such as the rehabilitation of waste dumps or decommissioning of tailings storage facilities. No area of the site is registered as a contaminated site that requires remediation. Macarthur has not been fined or prosecuted under any environmental legislation or received any improvement notices for current or past exploration activities from the Western Australian DMIRS.

Current exploration is governed by the tenure conditions presented in Table 6.

Table 6: Tenure conditions

Applicable tenement	Condition
The follow conditions apply to all Mining Leases (listed below): • M30/206 • M30/207 • M30/213 • M30/214 • M30/215 • M30/216 • M30/217 • M30/227 • M30/228 • M30/229 • M30/248 • M30/249 • M30/250 • M30/251 • M30/252	All surface holes drilled for the purpose of exploration are to be capped, filled or otherwise made safe after completion. All costeans and other disturbances to the surface of the land made as a result of exploration, including drill pads, grid lines and access tracks, being backfilled and rehabilitated to the satisfaction of the Environmental Officer, DMIRS. Backfilling and rehabilitation being required no later than six months after excavation unless otherwise approved in writing by the Environmental Officer, DMIRS. All waste materials, rubbish, plastic sample bags, abandoned equipment and temporary buildings being removed from the mining tenement prior to or at the termination of exploration program. Unless the written approval of the Environmental Officer, DMIRS is first obtained, the use of scrapers, graders, bulldozers, backhoes or other mechanised equipment for surface disturbance or the excavation of costeans is prohibited. Following approval, all topsoil being removed ahead of mining operations and separately stockpiled for replacement after backfilling and/or completion of operations. The construction and operation of the Project and measures to protect the environment being carried out generally in accordance with the POW approvals (where present). Where a difference exists between the POW approvals and the following (tenement) conditions, then the following (tenement) conditions shall prevail.
M30/249	No interference with Geodetic Survey Station NMF 395 and mining within 15 m thereof being confined to below a depth of 15 m from the natural surface.
M30/229	The development and operation of the Project being carried out in such a manner so as to create the minimum practicable disturbance to the existing vegetation and natural landform. All topsoil being removed ahead of all mining operations from sites such as pit areas, waste disposal areas, mineralisation stockpile areas, pipeline, haul roads and new access roads and being stockpiled for later re-spreading or immediately re-spread as rehabilitation progresses.
M30/213, M30/214, M30/215, M30/216, M30/217 and M30/227	Portions of these licences are overlain by the Mount Manning Nature Reserve. This reserve was granted in April 2000 and is identified by Western Australian Government reference number 36208. The iron mineralisation of the Project does not encroach on the nature reserve. Consent to explore on DEC – Managed Lands Conservation of Flora and Fauna Reserve 36208 granted subject to the following conditions: • Prior to lodgement of a POW, the lessee preparing a Conservation Management Plan (CMP) to address the conservation impacts of the proposed activities and submitting the CMP to the relevant Regional Manager of the Department of Environment and Conservation (DEC). This CMP shall be prepared pursuant to DEC-prepared "Guidelines for Conservation Management Plans Relating to Mineral Exploration on Lands Managed by the Department of Environment and Conservation" to meet the requirements of the Minister for Environment for acceptable impacts to conservation estate. A copy of the CMP and of DEC's decision on its acceptability under the guidelines is to accompany the lodgement of the POW application with the DMIRS. • At least five working days prior to accessing the reserve or proposed reserve area, unless otherwise agreed with the relevant Regional Manager of the Department of the Environment and Conservation (DEC-R), the holder providing the DEC-R with an itinerary and program of the locations of operations on the lease area and informed at least five days in advance of any changes to that itinerary. All activities and movements shall comply with reasonable access and travel requirements of the DEC-R regarding seasonal/ground conditions • The licensee submitting to the Director of Environment, DMIRS, and to the relevant Regional Manager, Department of the Environment and Conservation (DEC-R), a project completion report outlining the project operations and rehabilitation work undertaken in the program. This report is to be submitted within six months of completion of the exploration activities.
M30/213, M30/214, M30/215, M30/216, M30/217 and M30/227	All Mining Proposals submitted for the commencement, alteration or expansion of operations within the tenement boundary are to contain information that demonstrates the proponent has genuinely engaged with the DEC on the Mining Proposal. The level of engagement will be to the satisfaction of the Director Environment, DMIRS.

Applicable tenement	Condition
M30/213	Rights being reserved to persons authorised by the Chief Executive Officer of the DEC to enter the Lease and carry out land management operations and other duties and exercise such powers as may be necessary or expedient for the administration of the *Conservation and Land Management Act 1984* and Regulations, the *Wildlife Conservation Act 1950* and Regulations, the *Bush Fires Act 1954* and Regulations and the *Emergency Management Act 2005* and Regulations.
M30/207	No interference with Geodetic Survey Station SSM - Kalgoorlie 93 and mining within 15 m thereof being confined to below a depth of 15 m from the natural surface.
M30/227	No interference with Geodetic Survey Station SSM-KALGOORLIE 138 and mining within 15 m thereof being confined to below a depth of 15 m from the natural surface.
All the Mining Leases (listed below): • M30/206 • M30/207 • M30/213 • M30/214 • M30/215 • M30/216 • M30/217 • M30/227 • M30/228 • M30/229 • M30/248 • M30/249 • M30/250 • M30/251 • M30/252	Mining Leases must be surveyed by an Approved Surveyor upon grant of the tenement or approval of a Mining Proposal. The lessee submitting a plan of proposed operations and measures to safeguard the environment to the Director, Environment, DMIRS for his assessment and written approval prior to commencing any developmental or productive mining or construction activity. Mining on any road, road verge or road reserve being confined to below a depth of 15 m from the natural surface.

4.4 Permitting and Native Title Claims

The Project does not have any environmental liabilities from previous mining or exploration activities such as the rehabilitation of waste dumps or decommissioning of tailings storage facilities. No area of the site is registered as a contaminated site that requires remediation. Macarthur has not been fined or prosecuted under any environmental legislation or received any improvement notices for current or past exploration activities from the Western Australian DMIRS.

The main legislation that governs environmental protection at the Federal level is the EPBC Act. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of NES. Matters of NES have been identified within the Project area.

The primary legislation for environmental protection in Western Australia is the EP Act. With regard to mining approvals, projects may require assessment under two separate parts; Part IV and Part V, administered by the EPA and the Department of Water and Environment Regulation, respectively. Under Part IV of the EP Act, Proposals are referred to the EPA for a decision on whether the project has the potential to cause significant impacts on the environment.

Macarthur will need to undertake an environmental impact assessment in order to obtain environmental approval for development. The Company is not aware of any major environmental obstacles that would prevent approval of the Lake Giles Magnetite Project.

The Project sits within the Marlinyu Ghoorlie native title claim. The claim was registered on 28 March 2019 and is currently not determined. Native title rights in registration or grant give claimants the right to negotiate during the grant of mineral tenure. Macarthur's mining leases were all granted prior to registration of the Native Title claim and the current claim does not confer rights to negotiate or affect the tenure. There were no native title claims over the area at the time of grant and therefore no access agreements were required to be negotiated with claimants.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Topography, Elevation and Vegetation

The topography of the Project area is comprised of low ridges associated with the BIF units, generally striking in a northwest-southeast direction, that rise up from the surrounding sandy plains. Local relief is approximately 120 m with the highest point at approximately 520 mRL. Adjacent to the low ridges are flat to gently undulating areas of sheetwash and soil covered areas.

The vegetation of the Project area is dominated by mulga scrub with local patches of low to medium eucalypt woodland and areas of salt tolerant shrub and spinifex.

5.2 Access to Property

The Project can be accessed from Kalgoorlie-Boulder via the sealed Menzies Highway north for 130 km, then west from the town of Menzies for 120 km along the unsealed graded Evanston-Menzies Road (refer Figure 2).

Kalgoorlie-Boulder is serviced by daily commercial flights from Perth.

Access within the Project area is by a number of tracks cleared by previous explorers, and more recently by Macarthur. These tracks may become impassable after heavy rain.

5.3 Climate

The climate at the Project is characterised as a semi-arid climate. The Diemals weather station, located 65 km west of the Project at latitude 29.67°S and longitude 119.30°E, was operated by the Australian Bureau of Meteorology between 1970 and 1994 (Australian Bureau of Meteorology, 2011). Diemals recorded a mean annual rainfall of 275.7 mm with rainfall mostly in the winter months. The temperature averages over 40°C for 15 days in the summer months (from November to March) while in the winter months (from June to August) the temperature averages a minimum range from 3.9°C to 5.0°C. See Figure 4 for more details.

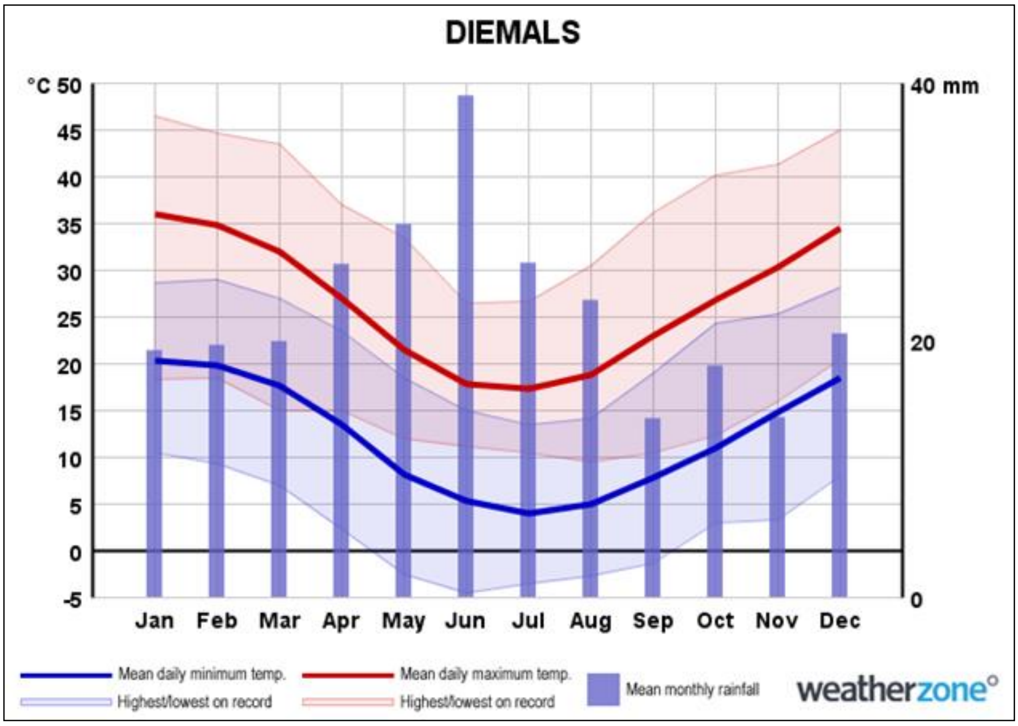

Figure 4: Average temperature ranges and rainfall on a monthly basis for Diemals weather station
Source: Australian Bureau of Meteorology (2011)

The climate at the Project area allows an operating season covering the full length of the year. In the Kalgoorlie region, mining and exploration activities are conducted throughout the year, with infrequent, generally short disruptions during and after periods of heavy rain.

5.4 Infrastructure

The Project is serviced from the city of Kalgoorlie-Boulder, with a population of 30,000 people (Australian Bureau of Statistics, 2016), which provides services and mining personnel to a large number of operating mines and exploration properties in the region.

Some limited facilities are available in Menzies including fuel, accommodation and meals. A railway line passes through Menzies, and road freight lines deliver to the town.

The Project site itself is remote with no existing infrastructure other than unsealed roads and an exploration camp.

Power generation for the exploration camp is by diesel powered generators with potable water trucked in from Kalgoorlie.

Network power is available in Kalgoorlie via the existing West Kalgoorlie substation approximately 130 km southeast of the Project. An overhead powerline would need to be constructed to utilise network power at the project. The Kalgoorlie gas line is also located 130 km east of the Project.

Potable quality water is available from the water pipeline owned by the Water Corporation that is located approximately 130 km south of the Project. Saline groundwater supply is likely to occur in the region, such as the Scorpion Paleovalley located approximately 30 km east of the Project (Rockwater, 2020).

The Eastern Goldfields Railway runs between Perth and Kalgoorlie and then south to the Esperance Port which has facilities for iron mineralisation handling, storage and export. The Eastern Goldfields Railway is located approximately 90 km south of the Project with total rail haul to the port approximately 500 km. Macarthur has commenced discussions with the railway owner, Arc Infrastructure regarding capacity on the rail line. Future economic studies will be required to investigate the Project’s requirements for a haul road to be constructed to access the rail line.

At this time, it appears that Macarthur holds sufficient mining leases necessary for proposed exploration activities and potential future mining operations (including potential tailings storage areas, potential waste disposal areas, and potential processing plant sites) should a mineral deposit be delineated at the Property for which any future mining studies may provide positive economic results. The adequacy of the Property area for required mining and processing infrastructure will be further assessed as engineering studies advance.

6 History

6.1 Property Ownership

Since the late 1960s, several exploration companies have held the exploration rights to the Project tenement area. There have been three main phases of exploration; nickel exploration from 1968 to 1972, gold exploration from 1993 to 2004, and more recently iron exploration. The following summary has been derived from Revell (2006), Farmer (1997a, 1998a, 1998c) and Busbridge (1998a, 1998b).

Between 1968 and 1972, the area was explored primarily for nickel sulphide mineralisation by Amax Exploration (Australia) Inc., Consolidated Goldfields Australia Limited, Geotechnics Pty Ltd, on behalf of Welcome Stranger Mining Company Limited, Kia Ora Gold Corp. NL and Delta Minerals NL and Le Nickel (Australia) Exploration Pty Ltd.

Between 1972 and 1993, there are no records of any significant exploration activity.

From 1993 to 1998, the region was explored primarily for gold by several companies, generally operating in joint ventures:

- In May 1993, Battle Mountain Australia Incorporated (Battle Mountain) was granted exploration licence E30/93 which partially overlaps with the southern portion of the area now covered by Macarthur's current mining lease M30/249.
- In August 1993, Aztec Mining Company Ltd (Aztec), a subsidiary of Normandy Exploration Ltd (Normandy), was granted exploration licence E30/100 covering western parts of Macarthur's current tenements, and in December 1993 Aztec was granted E30/99 which encompasses the area now covered by Macarthur's M30/213-217, 251, 252.
- In 1995 to 1996, Noble Resources NL (Noble) formed a joint venture with Battle Mountain to explore E30/93, with Noble managing exploration activities. Noble's interest in the joint venture was subsequently transferred to Barclay Holdings Ltd, a wholly owned subsidiary of Titan Resources NL (Titan).
- Titan withdrew from the joint venture in 1998, and Battle Mountain surrendered the tenement in 1998.
- In September 1994, Evanston Mines NL (Evanston) formed the Dodanea joint venture with Aztec to explore E30/99 and E30/100.
- Following Evanston's unsuccessful float, Evanston's share of the joint venture passed to Noble, and subsequently after an asset swap, on to sister company Titan in February 1997.
- In June 1998, Titan withdrew from the joint venture, and in December 1998 Normandy surrendered the tenements.

From late 1998 to 2003, the area was consolidated into the "Lake Giles Magnetite Project" by Mr Troy Dalla-Costa who was granted a number of tenements covering the area. In 2003, the tenements were purchased from Mr Dalla-Costa by Internickel Australia Pty Ltd (Internickel).

In early 2004, Internickel was purchased by Adex Holdings Limited (Adex). Macarthur purchased Internickel and the Project assets from Adex. In late 2005, Macarthur's wholly owned subsidiary Internickel was renamed to Macarthur Iron Ore Pty Ltd in 2010.

6.2 Project Results – Previous Owners

6.2.1 Nickel Exploration (1968 to 1972)

The 1968–1972 phase of nickel-focused exploration is reported by Ward (1970a, 1970b, 1970c) and Ward and Pontifiex (1970). Exploration undertaken during this period included grid establishment, geological mapping, rock chip sampling, magnetic, electromagnetic and induced polarisation geophysical surveying, and petrographic analysis of rock samples.

Geotechnics Pty Ltd was the only company to drill in the area during this period. Table 7 summarises the drilling completed by Geotechnics Pty Ltd; however, the grid that Geotechnics Pty Ltd used has not been re-established and the exact location of the drillholes is unknown.

Table 7: Summary of drilling 1968 to 1972 (modified from Ward 1970a, 1970b, 1970c)

Type	No. of drillholes	No. of metres	Maximum depth (m)
Diamond core	7	523	127
Open-hole percussion	15	658	60
Total	**22**	**1,181**	

It is unclear where these drillholes lie in relation to the areas of current interest for iron mineralisation. Rock chip sampling conducted by Geotechnics Pty Ltd during this phase of exploration returned assays from samples of outcropping BIF with iron assay results of 36.1% to 63.5% (Cooper, 2007). Although these results provided an indication of the Project's exploration potential they were not followed up, and no exploration specifically targeting iron mineralisation was conducted until Internickel commenced exploring the tenements in 2000.

6.2.2 Gold Exploration (1993 to 1998)

In May 1993, Battle Mountain was granted the tenement E30/93 that partly overlies the tenement M30/249, which is part of the Lake Giles area (Famer 1997a, 1998a, 1998c). Battle Mountain established a grid over E30/93 from which Macarthur collected 37 rock chip samples and completed a soil 50 m by 500 m sample program, which Macarthur subsequently in filled to a 50 m by 100 m spacing for a total of 1,175 samples. This soil sample program identified several gold anomalous zones with maximum grades of 3–12 ppb Au (Anon 1994).

In August 1993, Aztec was granted the E30/100 lease which is immediately west of the current Project tenements, and in December 1993 Aztec was granted tenement E30/99 (now covered by Macarthur tenements M30/213-217). Aztec collected 715 soil samples, 31 stream sediment samples and 901 soil auger samples with identified several anonymous gold zones which peaked at 53 ppb. Aztec drilled 80 rotary air blast (RAB) holes (Table 8) to test the anomalous gold zones, which returned weak mineralisation, with the best result being from drillhole DON06 with 25 m at 0.4 g/t (Smith and Govey, 1995; Busbridge 1998b).

Battle Mountain drilled 41 RAB drillholes (Table 8) in 1994–1995, targeting the anomalies identified in the soil sampling. These anomalies were named Soapbox and Enfield prospects in tenement E30/93. The best result from the RAB drillholes was from DOP8 for 4 m at 0.4 g/t at the Soapbox prospect (Anon 1995).

In 1995, Noble formed a joint venture with Battle Mountain to explore E30/93; however, Noble's interest was transferred to Barclay Holdings Limited, a wholly owned subsidiary of Titan, in February 1997.

Titan commissioned Telsa Airborne Geophysics in 1997 to complete an airborne geophysics survey of tenements E30/93, E30/99 and E30/100. The airborne survey included magnetics and radiometric surveys and was flown at a height of 50 m on 100 m line spacing. In the same year, Titan completed a 537-auger soil sample program over tenement E30/93 (Famer 1997a, 1997b 1998a).

In early 1998, Titan collected 311 soil samples on a 50 m by 80 m grid within tenement E30/93 but failed to define any anonymous gold zones (Busbridge 1998a). In mid-1998, Titan commissioned G&B Drilling to undertake a vacuum drilling program on tenement E30/100. The drillholes went down to a maximum depth of 1.5 m and a total of 1,275 samples were collected on a drill spacing of 100 m by 400 m. In December 1998, Titan withdrew from the joint venture and the tenement was surrendered (Busbridge, 1998a).

Table 8: Summary of the gold exploration drilling from 1993 to 1998 (modified from Smith and Govey 1995; Busbridge 1998b; Anon 1995)

Company	Type	Tenement	No. of drillholes	No. of metres
Aztec	RAB	E30/99, E30/100	80	3,442
Battle Mountain	RAB	E30/93	41	1,897
Total			**121**	**5,339**

6.2.3 Iron Exploration – Internickel (2001 to 2005)

From late 1998 to 2003, Mr Troy Dalla-Costa was granted a number of tenements in the Lake Giles area which were to become the foundation for the MIO tenement holding. Mr Dalla-Costa consolidated his holdings in the name of Internickel.

Internickel undertook detailed evaluation of all the historical data. In early 2004, Adex purchased Internickel from Mr Dalla-Costa and then Adex changed its name to Internickel. Macarthur purchased Internickel in late 2005.

The following exploration history is summarised from Fox (2001, 2002, 2003) and Cooper (2003, 2004, 2005, 2006). Internickel's initial exploration effort targeted gold and nickel. Mapping and sampling were undertaken by Keith Fox, resulting in the generation of a number of gold and nickel targets (Fox, 2003). Fox estimated that more than 100 km strike length of komatiitic ultramafic sequence prospective for nickel sulphides existed on the tenements.

In December 2003, following the observation of fine gold in panned soils, a program of metal detecting was completed in the area of gold-in-soil anomaly G14 (Fox, 2003). Two costeans were excavated and metal detecting within and adjacent to them resulted in recovery of a single large 26-ounce (about 0.8 kg) nugget together with a number of small nuggets between 1 g and 12 g in weight. The anomalous gold geochemistry is associated with zones of quartz veining. The orientation and dip directions of these zones are unknown.

In April 2004, GPX Airborne Pty Ltd undertook a helicopter Hoistem electromagnetic survey over the central part of the Lake Giles Magnetite Project (Figure 5). This area was known to be mainly covered by thin (<2 m) soils. Data were collected along east-west flight lines spaced 200 m apart and the total survey comprised 950-line km. Interpretation of the data indicated the presence of a large number of electromagnetic anomalies.

By 2004, iron mineralisation was also recognised as a significant target in the Project area. In early 2005, a scout surface outcrop sampling program of 29 BIFs was completed. All samples were analysed for iron, as well as for a large number of other elements. Seven samples were found to contain more than 50% Fe and two contained more than 60% Fe. Subsequently, applications were submitted (and granted) for the inclusion of iron mineralisation in the commodities listed for all the tenements.

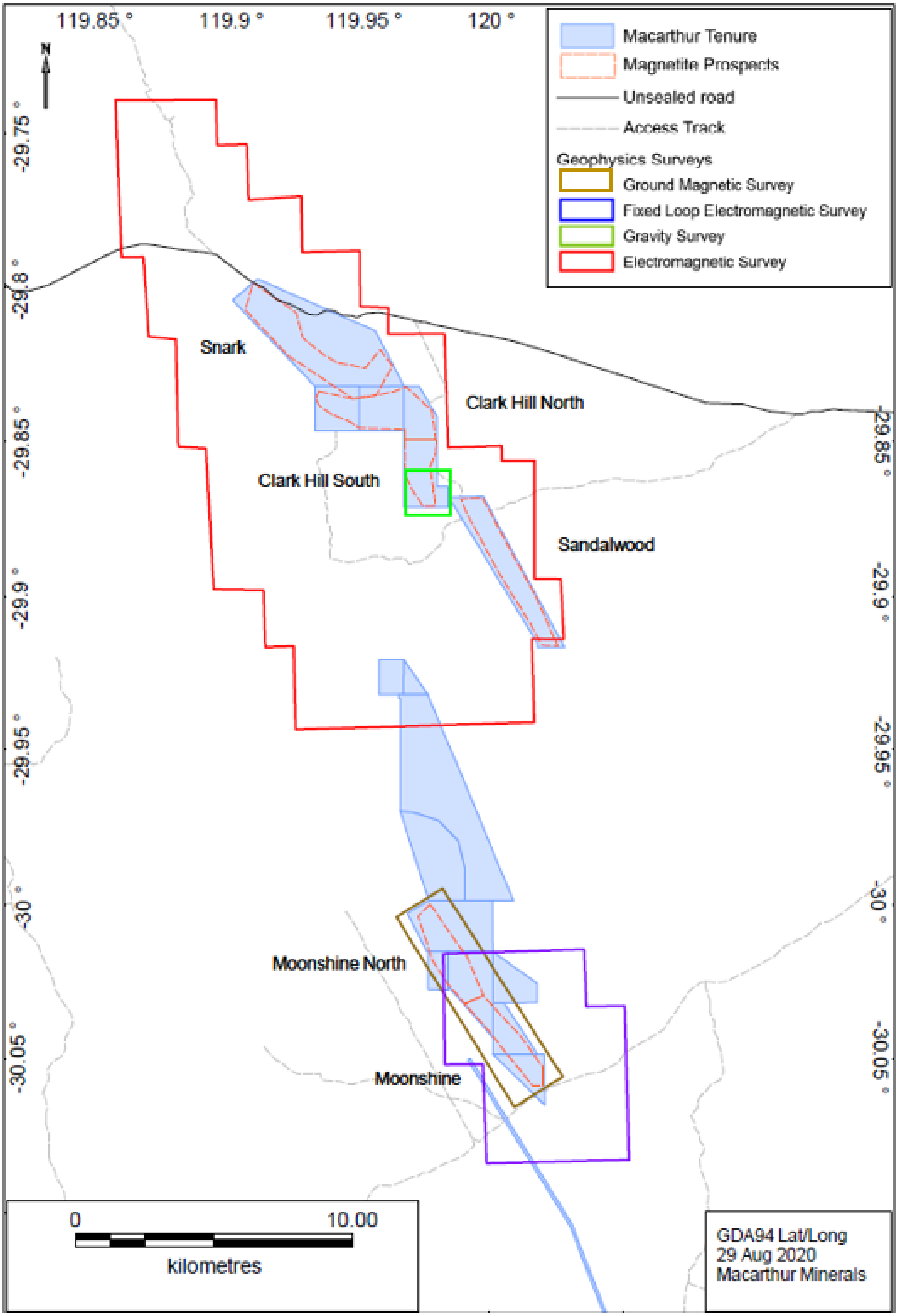

Figure 5: Location of exploration activity by Internickel
Source Macarthur (2020)

6.3 Previous Mineral Resource Estimates

Between 2007 and 2011, Macarthur completed Mineral Resource estimates for the magnetite deposits which were classified as Inferred and reported in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (11 December 2005), disclosed in accordance with NI 43-101 (30 December 2005), and filed on SEDAR.

The first Mineral Resource estimates were completed by Hellman and Schofield Pty Ltd (H&S) in 2007 for the Snark, Clark Hill North and Clark Hill South deposits (Abbot and van der Heyden, 2007). In 2009, H&S updated the Clark Hill North estimate and provided the first Mineral Resource estimate for the Sandalwood deposit (Abbot and van der Heyden, 2009a). In 2009, a Mineral Resource estimate was then completed for the Moonshine deposit and reported in addition to the previous estimates (Abbot and van der Heyden, 2009b). In 2009, CSA Global updated the Mineral Resource estimates for the Clark Hill North, Sandalwood and Moonshine deposits based on additional RC drilling (Allen, 2009), followed by updates to the Snark and Clark Hill South Mineral Resources in February 2010 (Macarthur, 2010). The most recent Mineral Resource estimate for the Moonshine deposit was reported by Snowden in 2011 (Fieldgate et al., 2011). The history of the Inferred Mineral Resource estimates for the Lake Giles Magnetite Project is shown in Table 9.

All the previous Mineral Resource estimates were prepared using RC and/or diamond drillhole data available at the time. Geological interpretations were digitised in cross section using industry standard modelling software available at the time, with 3D wireframes created to domain the magnetite mineralisation. Block models were constructed, and grades were interpolated into the block model using ordinary kriging. Where DTR results were available, concentrate grades were interpolated along with head grades. Bulk density values were assigned to the block model. The Mineral Resources were classified in accordance with the CIM Definition Standards.

The Issuer is not treating the previous Mineral Resource estimates as current Mineral Resources. These previous Mineral Resource estimates are presented for historical information and context only. Current Mineral Resource estimates are presented in Section 14 of this report.

Table 9: Previous Inferred Mineral Resource estimates – Lake Giles Magnetite Project

Deposit	H&S						CSA Global		Snowden	
	2007		2008		2009		2009–2010		2011	
	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %	Mt	Head Fe %
Snark	26.3	27.5	26.3	27.5	26.3	27.5	75	27.7	-	-
Clark Hill North	7.7	32.5	37.1	26.0	37.1	26.0	130.0	25.8	-	-
Clark Hill South	48.5	21.9	48.5	21.9	48.5	21.9	66	30.3	-	-
Sandalwood	-	-	84.7	28.3	84.7	28.3	335.0	31.1	-	-
Moonshine	-	-	-	-	144.1	25.9	510.9	27.8	710.5	30.2

6.4 Previous Mining

No mining is known to have been undertaken in the Project area or anywhere on Macarthur's tenements to date.

7 Geological Setting and Mineralisation

7.1 Regional Geology

Macarthur's tenements cover a portion of the Yerilgee Greenstone Belt which is over 80 km in length and up to 10 km wide and lies within the Southern Cross Province of the Yilgarn Craton. The Yilgarn Craton consists of multiple lenticular greenstone belts surrounded by variably foliated gneissic granitoids.

The greenstone belts consist of metamorphosed ultramafic, mafic and sediments, including BIF which are Archean in age and are commonly intruded by mafic, intermediate and granitic rocks.

The greenstone belts are generally metamorphosed to mid greenschist facies towards the central parts of the belt and lower amphibolite facies on the edges of the belt where they are in contact with the granitoids.

The greenstone belts are highly deformed, faulted and folded. Four deformation events (Svensson, 2012) are recognised regionally throughout the Yilgarn Craton:

- D1 – Movement along the south-north direction
- D2 and D3 – Shortening and shear movements in the east-northeast to west-southwest compression direction
- D4 – Lateral extension of the greenstone belt in a north-northwest and south-southeast direction.

Figure 6 shows the regional geology of the Macarthur tenement area and its surroundings, derived from Geological Survey of Western Australia (GSWA) (2020).

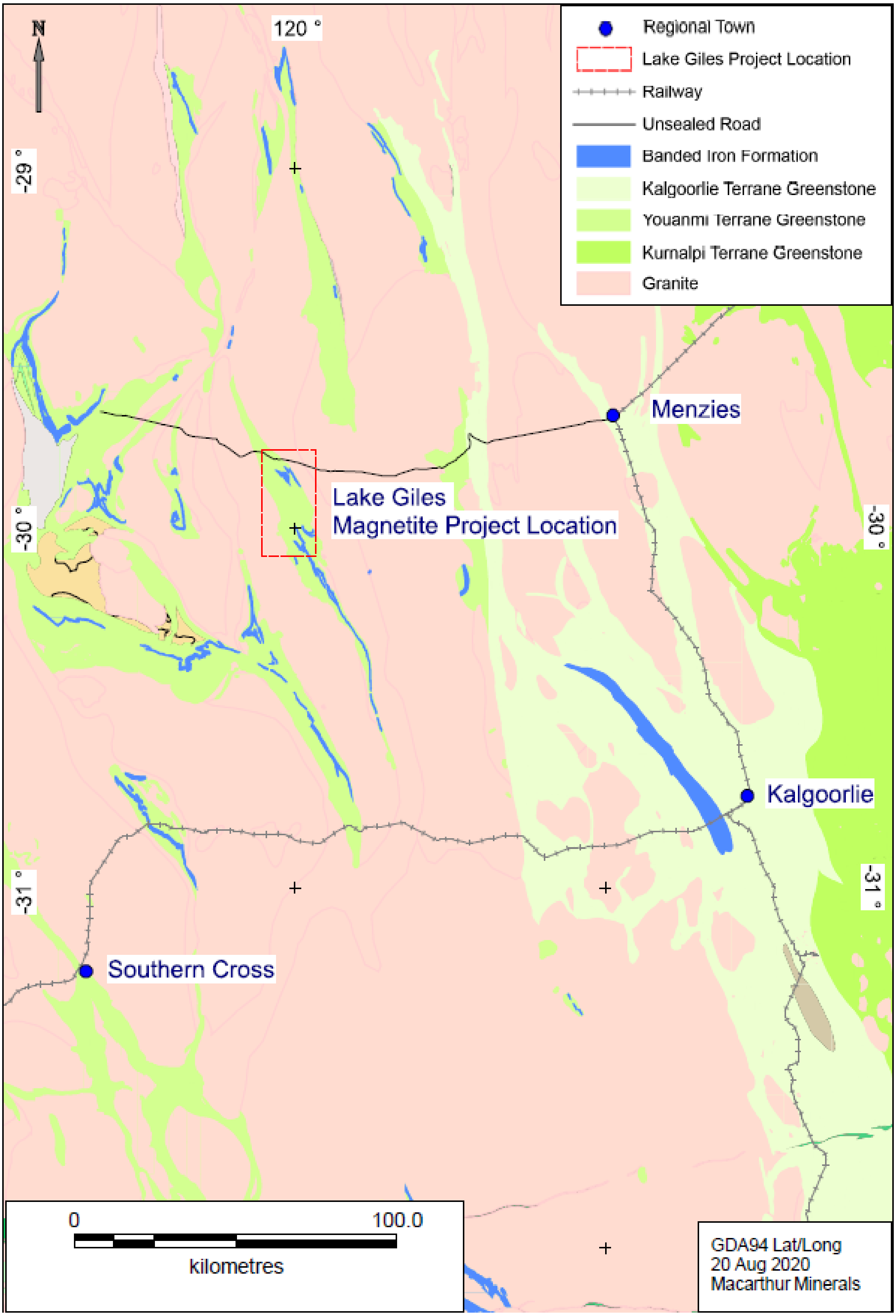

Figure 6: Project area with regional interpreted geology and infrastructure
Source: GSWA (2020)

7.2 Local Geology

The parts of the north-northwest trending Yerilgee greenstone belt covered by the Project tenements comprise a layered succession of Archean rocks. At the interpreted base of the succession is a sequence of high-magnesium basalt flows more than 1 km thick overlain by komatiitic ultramafic volcanic rocks with narrow interflow BIFs and in some cases, other sedimentary rocks (Svensson, 2012). Further high-magnesium basalt lavas with occasional interflow BIFs overlain, possibly unconformably, by sedimentary rocks (cherty, silicified, pyritic and graphitic) are interpreted to form the top of this sequence. In places, gabbroic sills interpreted to be co-magmatic with the upper high-magnesium basalts, have been intruded into the lower mafic and ultramafic lavas. The elongated lens shaped Yerilgee belt is bounded by major north-northwest trending fault/shear zones.

The Archaean sequence has been intensely folded. At least five possibly sinistral fault zones of similar but slightly more north-westerly trend are interpreted within the widest part of the belt and are believed to successively repeat the layered succession. Two northerly trending sinistral faults obliquely crosscut the belt in this area.

A number of large synclinal fold structures have been identified. These appear to be located adjacent to the eastern margins of the fault blocks. These folds have north-westerly and north-north-westerly trending axes and where mapped in detail (Greenfield, 2001) show plunges at 30–60° in the same direction. In general, the fold axes are steeply dipping. The folding appears to have been contemporaneous with faulting. In plan, the movement on the fault planes was sinistral but in a true sense is believed also to have been reverse faulting with the direction of movement on the western down-throw sides of the fault planes being inclined at 30–60° towards the east-northeast. The synclines and anticlines are considered to be drag fold structures.

The most recent notable tectonic event was approximately 2.6 billion years ago and appears to have dilated the north-northwest trending shear zones, generating north-northeast trending and conjugate northeast to easterly trending structures. These brittle fractures have in many places been intruded by granitic dykes or quartz veins. The Project tenements cover about 60 km of the greenstone belts strike length but because of fault repeats, they are estimated to cover more than 150 km of BIF sequence strike length.

7.3 Property Geology and Mineralisation

Figure 7 shows the location of the main prospect areas of the Project superimposed on the local geology. Figure 13 to Figure 15 (Section 10) present outcrop maps within the individual prospect areas, overlain by drillhole collars.

The iron mineralisation consists of secondary pisolite mineralisation, primary magnetite mineralisation associated with un-oxidised BIF and ultramafic rocks, and goethite-hematite mineralisation associated with oxidised BIF.

The hematite/goethite units exist largely as a supergene product. Weathering has resulted in the leaching of majority of the silica from the BIFs, thus producing a rock rich in iron and low in silica. These enriched bands vary from 1 m to 30 m in true thickness and are largely steeply dipping by 70–90°.

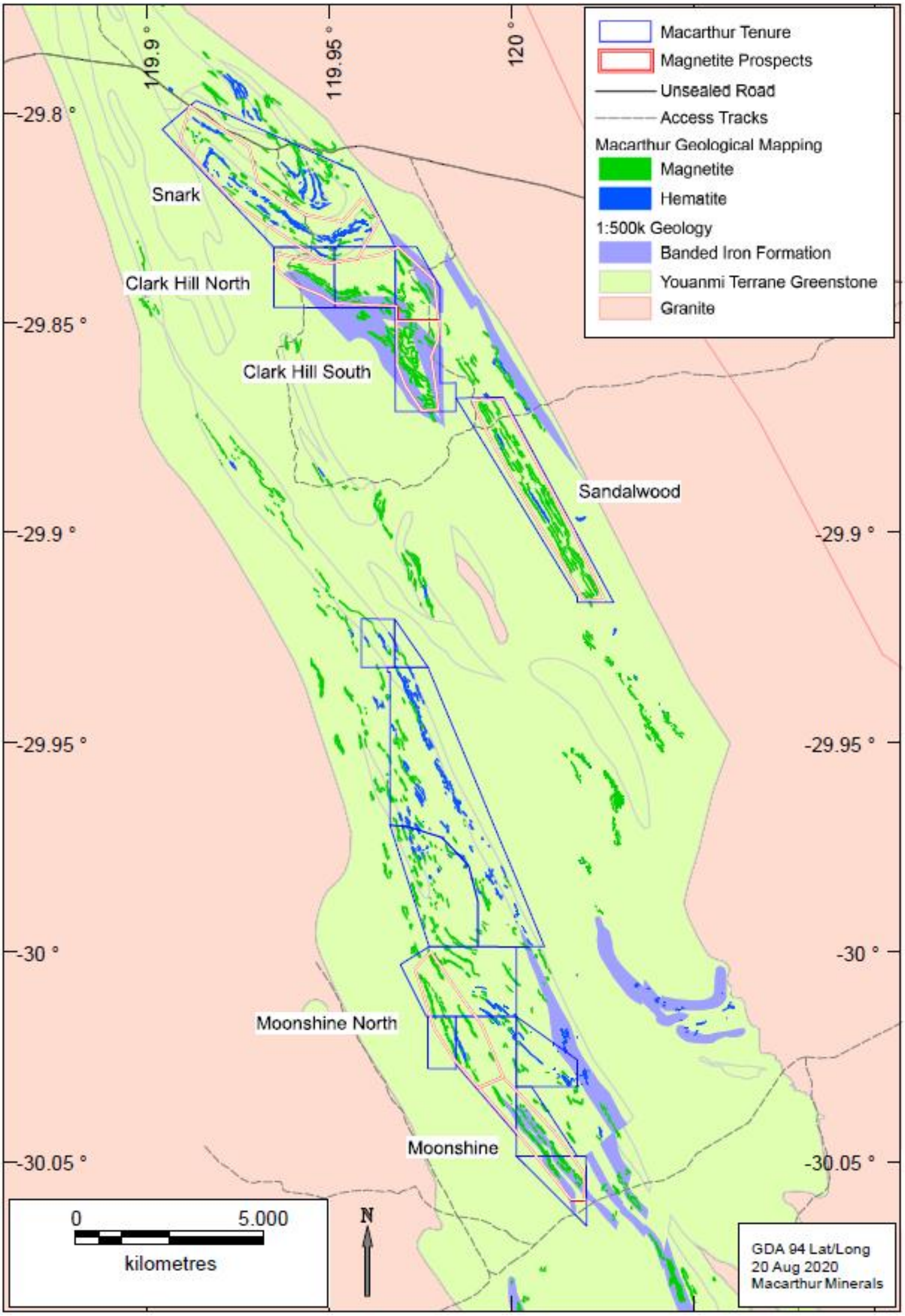

Figure 7: Interpreted geology of the Lake Giles Magnetite Project
Source: GSWA (2020)

The magnetite mineralisation is associated with primary magnetite hosted by BIF. The multiple BIF units steeply dip 75–85° to the west and strike approximately 320° and 335° respectively. The units have an average thickness of 15 m, over a strike length of 17 km. Examples of outcropping BIF are presented in Figure 8 and Figure 9, which show the distinctive laminar style of lithology present in BIFs. Note that the width of outcrop does not necessarily equate to the width of the BIF unit below surface, with erosion often delaminating the exposed rock resulting in a thinner width of host rock, compared to the non-eroded equivalent rock unit down dip and below surface.

Figure 8: Outcrop of BIF containing magnetite mineralisation, Moonshine (geological hammer provides scale)
Source: Macarthur (2020)

Figure 9: Outcrop of BIF containing magnetite mineralisation, near LGRC_0084 Sandalwood (geological hammer provides scale)
Source: Macarthur (2020)

A number of folds with a northwest plunge have been identified. Further work towards interpreting the structural geology of the Project is ongoing.

The outcropping geology of the project area is comprised of a combination of unaltered silica rich 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 m and 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 iron grades are generally normally distributed, as opposed to log-normally for the altered haematite/goethite BIF, with grades consistently between 20% Fe 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, continuous along strike for >200 m, and >60% Fe, located in the Moonshine North deposit. This pocket of high-grade magnetite mineralisation is interpreted to be the result of structural and geothermal alteration of the primary BIF fabric.

The mapped outcrops range from locally dark, rich and dense mineralised BIF to porous and lateritic weathered BIF with locally enriched layers. An example of Macarthur's outcrop mapping is presented in Figure 10.

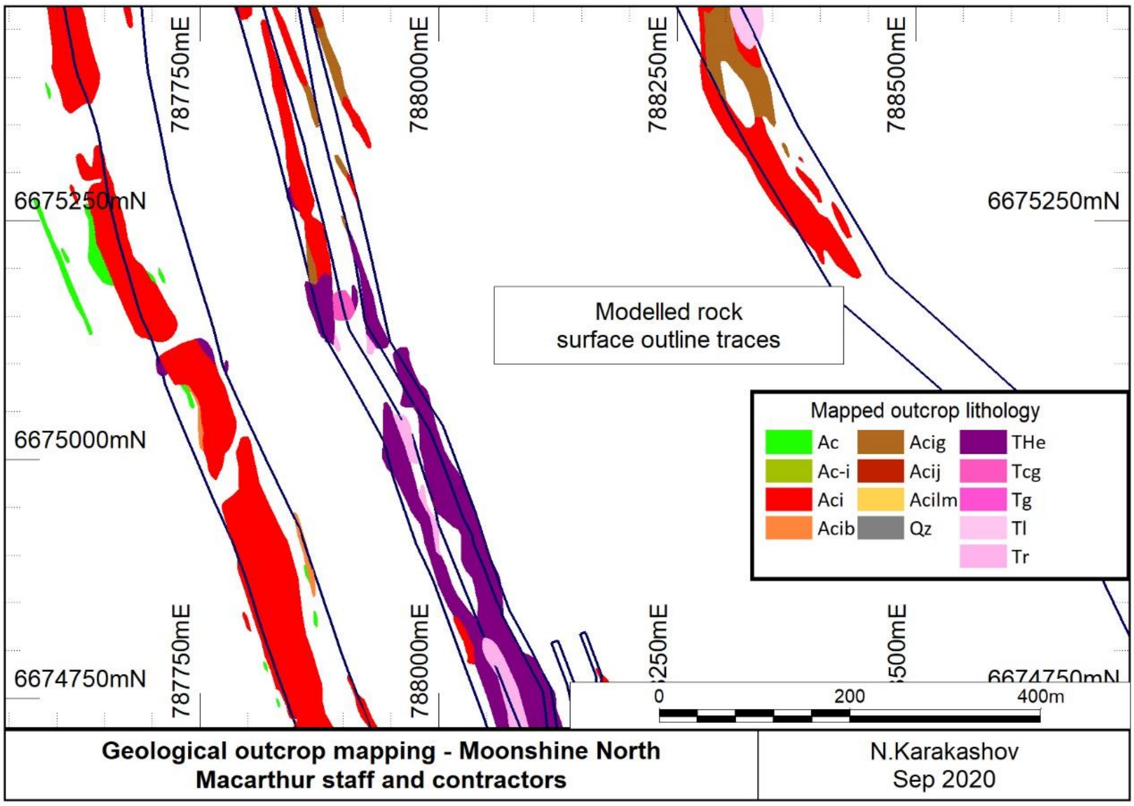

Figure 10: A small section of Macarthur's outcrop mapping style at Moonshine with modelled rock surface traces in black
Source: Karakshov (2020)

In RC chips, the mineralised material is dusty and red-brown to purple, and generally very fine grained.

The local high-magnesium basalts and ultramafics do not have significant outcrops due to strong weathering, especially proximal to the BIF ridges, where Macarthur has concentrated its mapping and interpretation efforts. Although some observations of ultramafic textures, such as spinifex and possible cumulate have been described, no petrological or geochemical analyses have been performed on samples from within the Project area.

Logged komatiite and ultramafic units are typically thin (<10 m true thickness) and strongly weathered near the surface and are only identifiable at depth through drilling. The ultramafics are usually found proximal to the hangingwall of the BIF units.

Serpentinised high-magnesium basalts form the bulk of the geology at Lake Giles, forming thick, continuous, fine to medium grained granular units, occasionally cut by minor quartz veins and hosting sulphidic shales, locally including several metres of massive iron sulphides. Mafic intersections of interest have been occasionally investigated for gold mineralisation, but no specific targeting for gold has been recorded.

Local faults are mostly interpreted from surface outcrop mapping aided by geophysics (particularly aerial magnetic anomalies) and are rarely observed within drillholes. This is most likely due to majority of drilling targeting the main section of undeformed tabular BIF ridges. Most of the interpreted local faults tend to be sub vertical shear structures, truncating or occasionally displacing BIF bodies.

Structural deformation within the main BIF packages is generally weak, forming gentle kink banding and box folding, although some sections are interpreted as showing intense recumbent folding with sub-vertical axial planes, such as the southern edge of Moonshine. The larger BIF bodies at Moonshine and Moonshine North have relatively consistent thickness and dip to depths of over 250 m from surface as tested by a number of drillholes, increasing confidence that the remainder of the BIF ridges at Moonshine behave in a similar way and are not truncated at depth by synclines or other structural mechanisms (Figure 11).

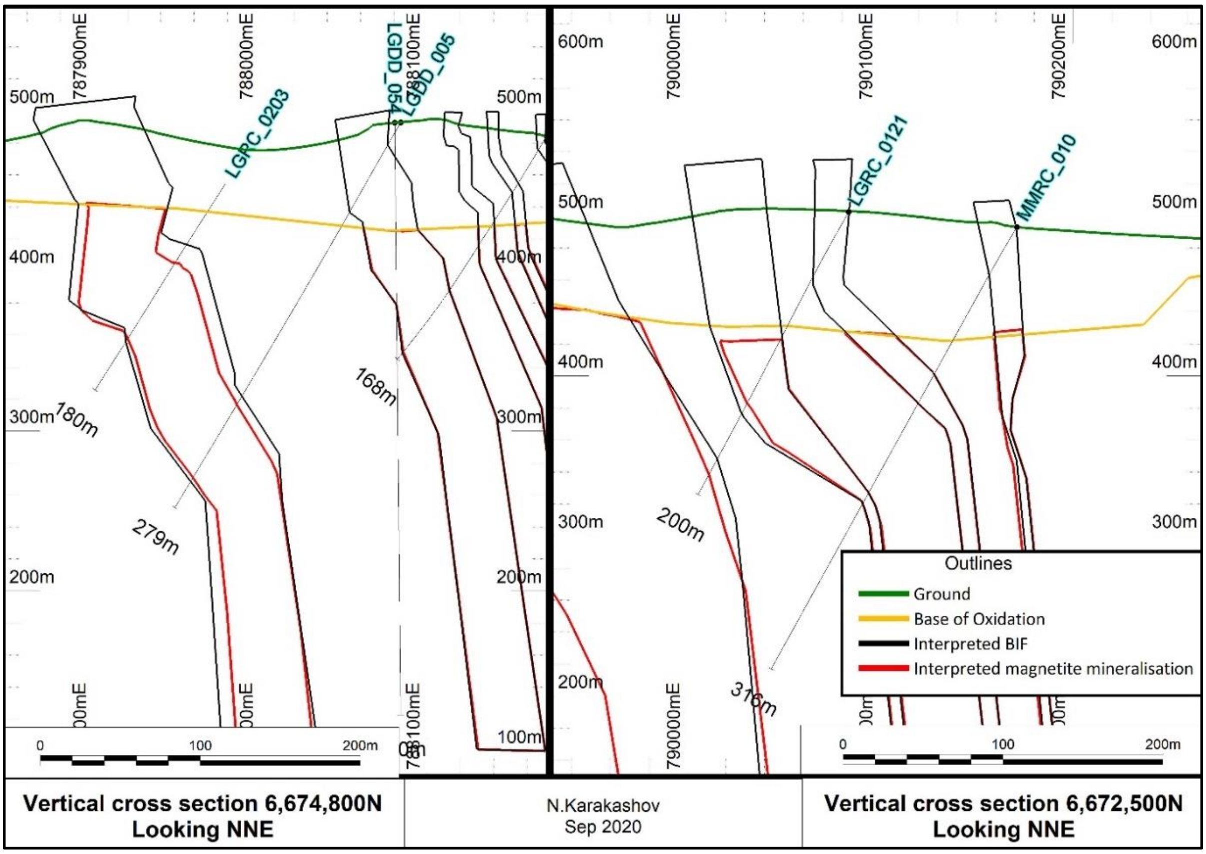

Figure 11: *Cross sections through Moonshine North (left) and Moonshine (right), showing depth of drilling through magnetite mineralisation, BIF units (grey) and magnetite mineralisation domains within the BIFs; view to north-northwest*

Source: Karakashov (2020)

7.4 Weathering Profile

The rocks of the Lake Giles Magnetite Project have been logged into six different weathering classifications:

- Complete – All clay with no remnant rock texture
- Extreme – Largely clay with some remnant rock texture
- Strong – Rock texture moderately preserved, significant presence of fines, often weak
- Moderate – Rock texture fully preserved, all minerals show weathering
- Partial – Oxidation limited to the most unstable minerals only (e.g. sulphides)
- Fresh – No oxidation of any minerals.

Majority of the hematite/goethite mineralisation grade (>50% Fe) material is located within the Strong and Moderate weathering classifications. The boundary between Partial oxidation and Fresh rock has variable depths within the Project area, with downhole (-60° dip) depths ranging from 30 m to 100 m.

The magnetite is present in the fresh BIFs along with high quantities of silica. This is the primary unaltered form of BIFs at site and in general has not been subject to any significant later iron enrichment.

The base of the Complete oxidation weathering profile strongly plunges downward proximal to the BIF bodies, rapidly rising to a relatively shallow depth of 3–10 m in the mafic/ultramafic rocks where distant from BIF units. This shallow depth of weathering is only observed at a handful of locations. Majority of drillhole collars at the Project are situated close to BIF units, and the depth to the base of Complete oxidation is logged to greater depths, compared to holes drilled distal to the BIF units.

Cross sections through the magnetite Mineral Resource are presented in Section 14.3.3, which demonstrate the variable depth of weathering with respect to proximity to the BIF units.

8 Deposit Types

8.1 Mineralisation Styles

The tenements held by Macarthur are known to be prospective for iron as well as nickel and gold mineralisation. The iron mineralisation is related to the extensive BIF units that occur throughout the tenements. Aerial magnetic data shows that BIF units totalling at least 73 km of strike occur within the tenements, mostly under shallow cover.

Weathered and leached BIFs host the massive hematite iron mineralisation deposits located in the northwest of Australia, such as the Tom Price (Rio Tinto) and Mount Whaleback (BHP) deposits.

A BIF is defined as a rock composed of dark-coloured layers of iron-rich minerals that are interlayered with light-coloured, silica-rich material. These rocks were principally deposited worldwide from seawater as chemical sediments in marine basins or seas about two billion years ago.

The main minerals that form the layers in BIFs include quartz (silicon oxide), hematite (an iron oxide), siderite (an iron carbonate), and stilpnomelane (a potassium, iron, magnesium aluminosilicate). BIFs appear to have been deposited in areas of the ocean where seawater with high contents of dissolved iron and silica came into contact with water containing higher amounts of oxygen, which resulted in the precipitation of hematite and chert (microcrystalline quartz).

Most of the iron and silicon probably came from upwelling iron-rich, deep ocean currents derived from ocean floor volcanic systems. Because of their great thickness and the enormous areas that they cover, BIFs probably accumulated on wide continental shelves at water depths of over 200 m.

The process of iron deposition in the Proterozoic seas, 2.5–1.9 billion years ago, is thought to have involved a fine balance between the chemistry of the ancient atmosphere and oceans at a time when the oxygen content of the atmosphere was beginning to increase. It was the emergence of the earliest forms of life, tiny microbes (cyanobacteria) that produced oxygen through photosynthesis, that probably saw the composition of the early atmosphere begin to change.

An example of a typical BIF in outcrop is presented in Figure 12. The location of this outcrop is approximately 1,000 km to the north of the Lake Giles Magnetite Project; however, it is similar in nature to the BIFs located at the Project.

Figure 12: Example of layered BIF sequence surface expression, near LGRC_0038, Clark Hill South, showing alternating bands of increased iron oxide presence (dark layers) and more silica-rich bands (light layers)
Source: Macarthur (2020)

8.2 Conceptual Models

Iron mineralisation currently being explored on the Project comes in two forms:

- Magnetite – present in the fresh BIFs along with high quantities of silica. This is the primary unaltered form of BIFs at the Project and in general has not been subject to any significant later iron enrichment.
- Hematite/Goethite – present in the weathered BIFs with lower quantities of silica. It is the product of supergene enrichment of the BIFs, which results in the leaching of the silica from the primary fresh BIFs and in some cases addition of iron from mineralising solutions. This results in elevated iron content in comparison with the fresh BIF.

The mineralisation at the Snark, Clark Hill, Sandalwood, Moonshine and Moonshine North deposits is associated with primary magnetite mineralisation hosted by BIF. The multiple BIF units steeply dip 75–85° to the east and strike approximately 320–335°, with abundant outcrop. The BIF units have an average thickness of 15 m, varying from 10 m to 150 m in true thickness.

The conceptual model for the magnetite mineralisation is a relatively simple assumption of a primary rock fabric with moderately variable concentrations of predominantly Fe(II,III) type magnetite iron oxide, within a moderately siliceous fine grained BIF, varying in grade between 20% and 45% in-situ Fe. DTR assays show strong recoveries of the iron, returning 70–90% of the original iron content in the magnetic fractions, with the remaining iron fraction not fully liberated from very fine-grained silica. This translates to bulk mass recoveries via DTR (the mass of magnetic fractions compared to total feed) in the range of 15% to 80% within the confines of the Mineral Resource, with the DTR results rapidly diminishing outside of the hard lithological boundary of the BIF unit, or within the siliceous footwall, as commonly seen in Moonshine. This is supported by the close correlation between lithological logging of BIF and associated mineralisation, and the x-ray refraction (XRF) head grade analysis and DTR tests for the drill samples.

9 Exploration

Macarthur took over the tenements now known as the Lake Giles Magnetite Project in late 2005 with the purchase of Internickel and its assets. Internickel was later renamed to Macarthur Iron Ore Pty Ltd in 2010. Macarthur immediately continued with the ongoing exploration program for nickel and gold. In particular, anomalies generated by a 2004 helicopter electromagnetic survey (HoistEM, see Section 6.2.3) were visited and many were mapped and sampled, with emphasis on the search for nickel-bearing gossans.

Nine specific electromagnetic anomalies were identified and modelled, and five fixed loop transient electromagnetic surveys were then planned and undertaken by Outer-Rim Exploration Services from June to August 2006. The results were interpreted and reported by Southern Geoscience Consultants in September 2006. A number of anomalies were generated despite poor positioning of loops. No follow-up work was undertaken.

Iron mineralisation associated exploration activities (non-drilling) commissioned by Macarthur at the Project area since 2005 includes geological and geomorphological mapping and geophysics, including air and ground magnetic anomaly, ground gravity, rock chip, auger and regional soil sampling (Table 10).

Table 10: Summary of Macarthur's iron exploration – 2005 to 2013

Period	Activity
2005 to 2006	Geological mapping and reconnaissance rock chip and auger sampling of exploration targets including pisolite and BIF iron targets.
June 2006	Auger sampling of pisolite iron targets, with approximately 229 holes drilled to around 4 m depth on a 100 m east-west by 500 m north-south pattern.
2008	Ground gravity survey.
2009	Ground magnetic anomaly survey at Moonshine and Moonshine North.
2009 to 2013	Lithological surface outcrop mapping.
2010	Geomorphological mapping of Lake Giles, covering all prospects. Aerial magnetic anomaly survey by Southern Geoscience Consultants.
2011	LiDAR topographic and imagery survey for the entire Lake Giles Project area.
2013	Regional soil sampling for entire Lake Giles Project area and Project area grid soil sampling.

The 2008 ground gravity survey by Haines Surveys (2008) covered a small portion of Moonshine and Moonshine North with 4,103 stations at intervals of approximately 200 m over 38 east-west trending lines spaced at 200 m to produce a Bouguer anomaly map used to aid in geological interpretations and targeting. Although the survey was targeting haematite mineralisation it has still proven useful in providing background information and support for the magnetite geological modelling.

In 2009, Resource Potentials performed a ground based magnetic anomaly survey in the Moonshine and Moonshine North prospects using 50 m line spacing for a total of 308 line km of data. The survey identified several prospective strongly anomalous magnetic bodies. The survey suggested a depth extent of magnetite mineralisation of at least 200 m. The images from this survey have been extensively used to aid in geological modelling and to support the thick tabular steeply northeast dipping general shape of the magnetite-bearing BIF bodies.

Since 2009, exploration activity has focused on geological mapping and drilling of magnetite targets. Between 2009 and 2013, several outcrop mapping campaigns were undertaken by Macarthur staff and contractors covering the entire project area from Snark to Moonshine. Initially outcrop mapping concentrated on simply differentiating silica leached, haematite-goethite altered BIF and unaltered oxidised siliceous BIF to aid in targeting for haematite goethite enriched mineralisation. At the same time, a number of areas were mapped in much greater detail by CSA Global contractors, whereby Moonshine, Moonshine North and Clark Hill North were included. The detailed mapping performed in 2010 delineated a greater diversity of rock types especially over the BIF ridges and outlined the outcrops in fine detail, helping to establish the strike and serve as a good indicator of the width and continuity of the main magnetite bearing lodes at the Moonshine prospects.

This detailed mapping style was adopted for the later stages of Macarthur's outcrop mapping, which re-mapped Snark and all remaining haematite-goethite prospects, increasing the geological confidence in the modelling in those areas.

Detailed mapping from 2009 through to 2012 outlined surface lithologies of interest, which were targeted in subsequent drilling programs. These mapping programs assisted in defining the continuity and thickness of individual mineralised domains, supporting the Mineral Resources that are the subject of this report.

Russel (2010) conducted regional geomorphological mapping of the Lake Giles area, with the specific aim to produce a list of secondary iron targets such as canga (iron-rich duricrusts that cap iron mineralisation), detrital iron deposits, channel iron deposits, and bedded iron deposits for follow-up exploration by Macarthur. The mapping area extended over the entire Project area from the northern extents of Snark to beyond the southern extents of Moonshine. Some of the generated targets were subsequently drilled to evaluate the regional potential for secondary iron deposits at Lake Giles. The mapping also proved useful for general geological modelling throughout the Project area and assisted in the targeting and placement of some holes as well as a better understanding of the weathering depth and profile, especially over the mafic and ultramafic lithologies surrounding the BIF bodies.

In June 2011, Outline Global Pty Ltd performed a 200 Hz LiDAR survey over the entire Lake Giles Project area, producing a 1 m resolution 0.5 m contour terrain model, as well as RGB composite and NIR imagery. The LiDAR survey was used for environmental assessment and targeting, vegetation mapping as well as infrastructure planning and accurate terrain surface modelling for Mineral Resource estimates and geological mapping.

In 2013, a regional soil sampling program was undertaken by Macarthur, which included several spacing patterns. A 1,000 m grid pattern covered the entire project area from Snark to Moonshine and beyond. Following this, several areas in Moonshine and Moonshine North were covered by a 100 m x 200 m (east x north) grid pattern. Although the soil sampling data was not directly used in the magnetite resource estimates, the results were nonetheless useful in geological modelling of the mafic and ultramafic rocks surrounding the BIF packages.

A summary of exploration drilling methodology and results, used to support the Mineral Resource estimates discussed in this report, are presented in Section 10.

10 Drilling

10.1 Drilling Summary

The magnetite Mineral Resource estimate includes drilling and sampling completed from 2006 to 31 December 2019.

Drill collar plans are presented in Figure 13 to Figure 15 which show the locations of drillhole collars superimposed on a geology base.

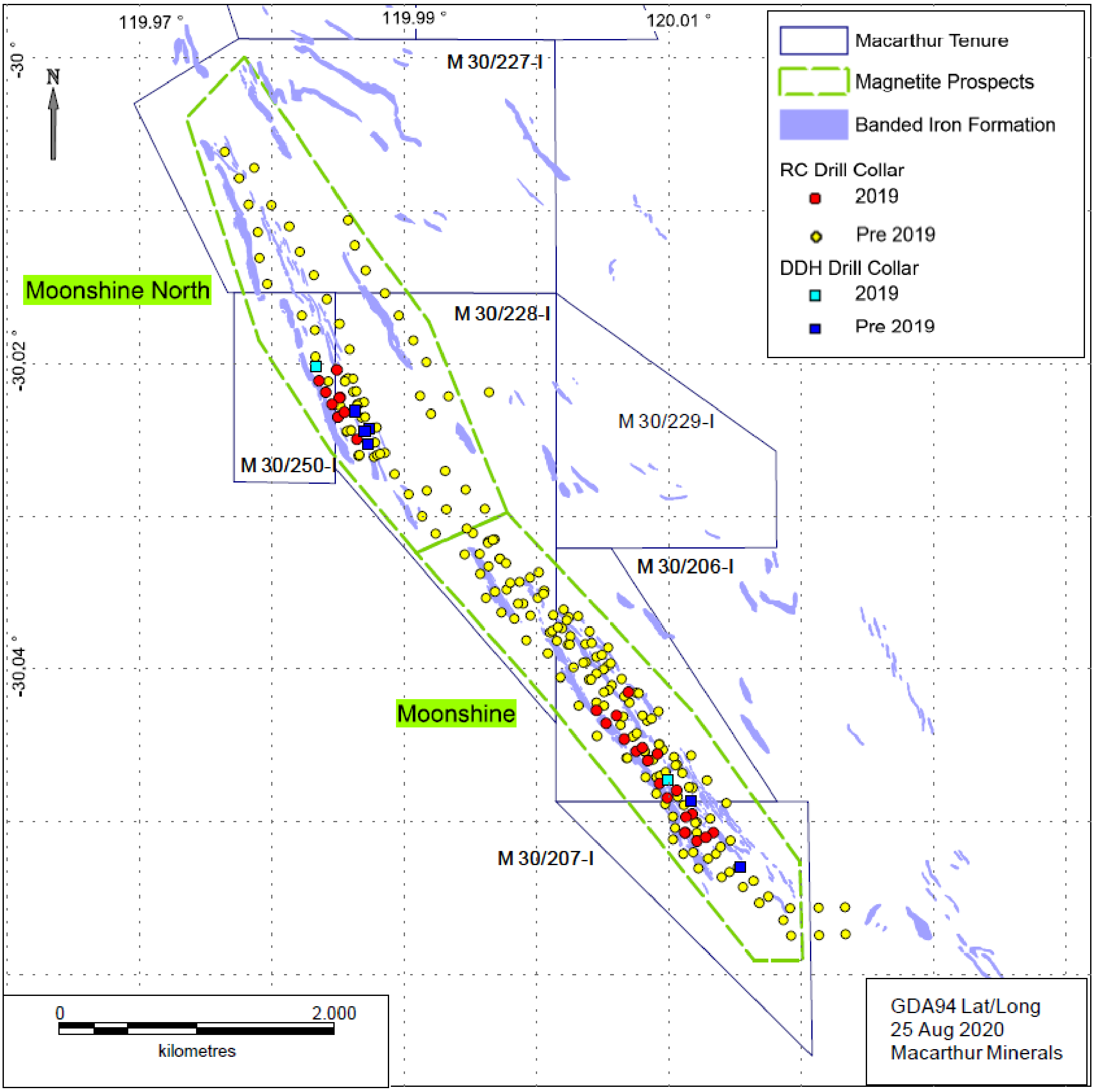

Figure 13: Drill collar plot, Moonshine and Moonshine North, showing drill collars by type and program, mapped BIF outcrop and tenure

Source: Macarthur (2020)

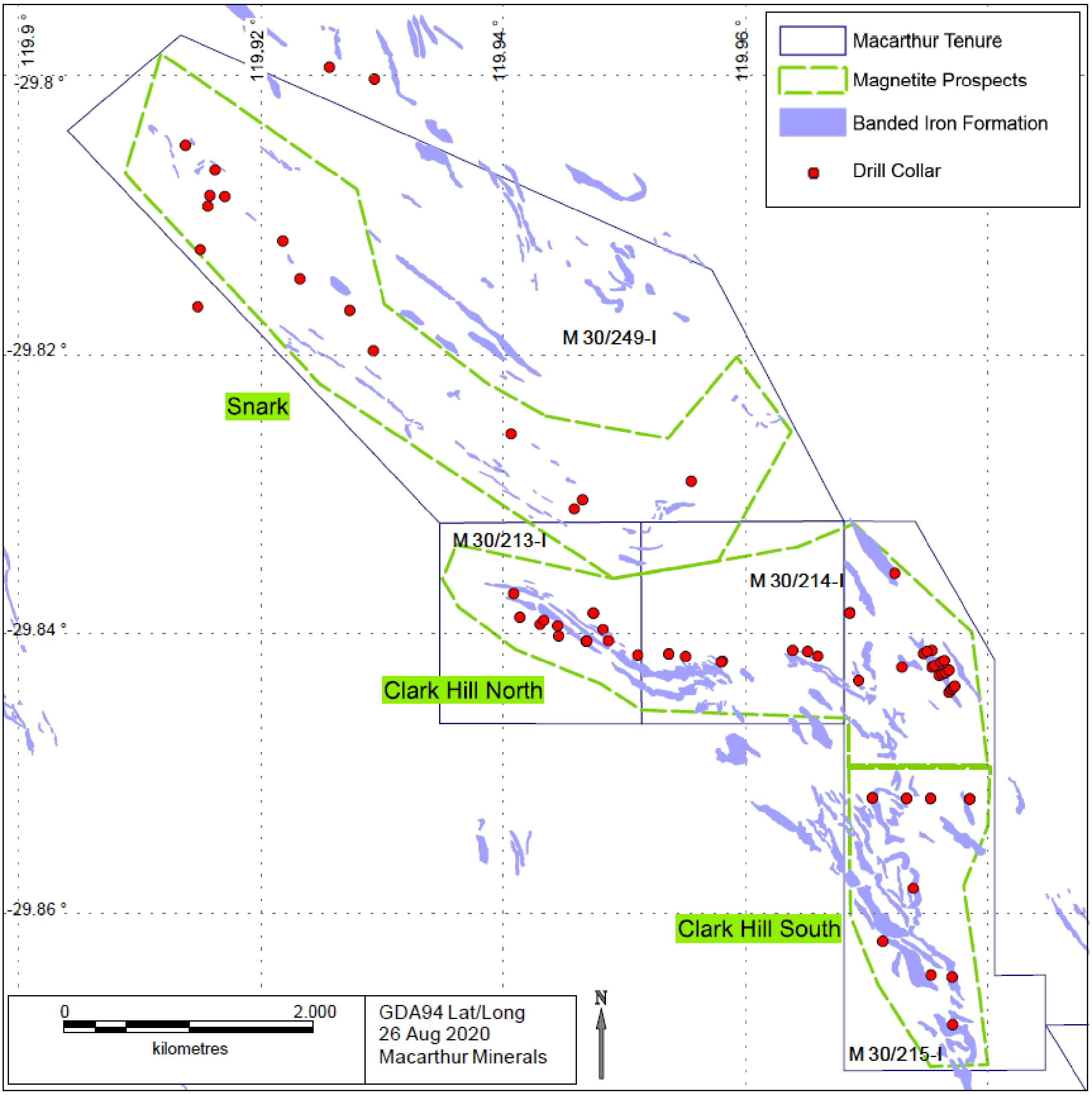

Figure 14: Drill collar plot, Snark, Clark Hill North and Clark Hill South, showing RC drill collars, mapped BIF outcrop and tenure

Source: Macarthur (2020)

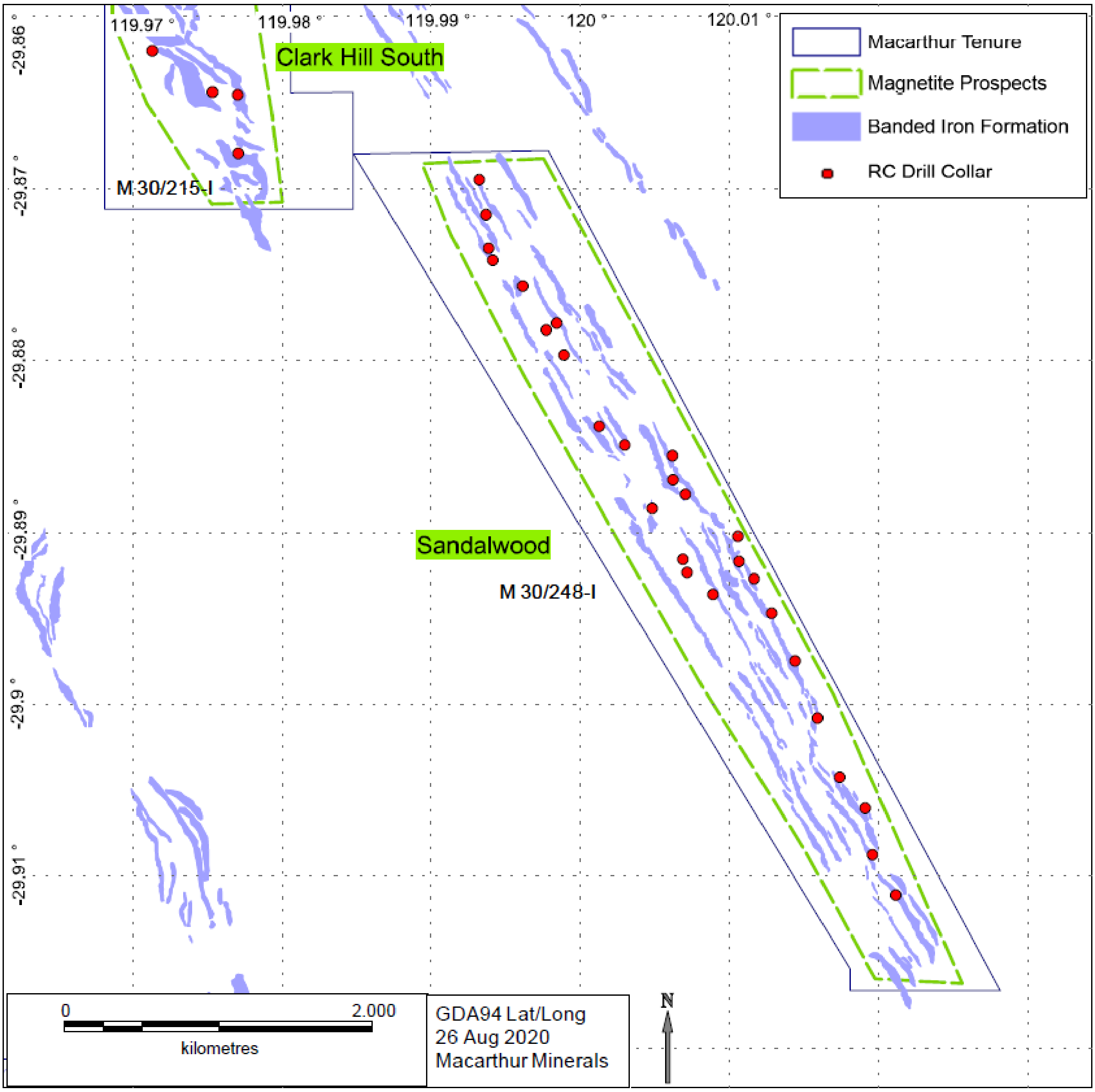

Figure 15: Drill collar plot, Sandalwood, showing RC drill collars, mapped BIF outcrop and tenure (the southern end of Figure 14 is to the north of the plot)
Source: Macarthur (2020)

Macarthur's drilling at the Snark, Clark Hill, Sandalwood, Moonshine and Moonshine North prospects totals 373 RC and diamond drillholes. These results do not include drilling at Macarthur's hematite project.

In the Snark, Clark Hill North, Moonshine and Moonshine North prospects, most of the drillholes are drilled perpendicular to strike of the BIF units, intersections approximate the true thickness of the BIF units. In Clark Hill South, the orientation of drillholes varies and is not always perpendicular to surface outcrops due to the structural complexity of the area in comparison to the other prospects, where the BIF ridges are relatively continuous and consistent in strike. In Moonshine, most of the drillholes are oriented 080° azimuth, dipping -60° or 240°azimuth dipping -60°, with a minor number of drillholes having a 030° azimuth dipping -60° or a dip of -90°. At Moonshine North, the azimuths range from 240° to 280° but all dip -60° towards the west.

The drillhole spacing varies from 50 m to 300 m and does not transect the mineralisation on some transverses.

Table 11 presents a summary of all drilling, by deposit area, at the Lake Giles Magnetite Project.

Table 11: Summary of Lake Giles Magnetite Project drilling by deposit area

Deposit	Years	Diamond holes		RC holes		Total	
		No.	Metres	No.	Metres	No.	Metres
Clark Hill North	2006–2010	5	1,002	60	8,551	65	9,553
Clark Hill South	2006–2007	-	-	9	2,086	9	2,086
Sandalwood	2007–2010	-	-	38	6,933	38	6,933
Snark	2006–2007	-	-	16	3,007	16	3,007
Moonshine/Moonshine North	2008–2019	16	3,155	229	41,808	245	44,963
Total		**21**	**4,157**	**352**	**62,385**	**373**	**66,542**

10.2 Drilling Techniques and Procedures

10.2.1 Overview

Drilling and sampling procedures were consistent across all exploration prospects within each drilling program, with minor changes adopted across the years as different campaigns employed different practices.

Macarthur contracted Orbit Drilling Pty Ltd to carry out both the RC and diamond drilling for all prospects between 2006 and 2018, and then iDrilling Australia (previously named Orbit Drilling Pty Ltd) in 2019. Both firms are exploration drilling companies based in Perth, Western Australia. Two RC drill rigs were utilised, a Schramm T660 (Volvo 8x4 wheel rig) and a track mounted Schramm T450WS.

Macarthur has a number of procedures in place, which have been designed to reduce the risk of errors from drilling, sampling and assaying processes. These procedures are summarised below.

10.2.2 Drillhole Planning

Holes drilled prior to 2019 were planned and supervised by Macarthur geological staff. Infill drillholes drilled in 2019 at the Moonshine deposit were planned by the QPs of this report and supervised by Macarthur geological personnel. Holes were planned to intercept the host lithologies in the most representative way possible, with consideration given to local terrain, outcropping geology and results from previous drilling. During RC drilling, a Company geologist would supervise the work and log the geology to each metre interval (or at appropriate intervals during diamond drilling) and end the hole at a certain depth based on the outcome of the drilling and the estimates provided by the drillhole planning.

10.2.3 Drillhole Surveys

Planned drillhole collar positions were marked by GPS, and if clearing was required to provide a suitable drill site, then planned collar positions were re-marked after clearing. To assist with drill rig alignment, two sighter pegs were placed at appropriate distances from the collar position using a sighter compass. In areas of high magnetic field deviation due to underlying magnetite bodies, a GPS azimuth method was used. All drill collars were surveyed with high accuracy Real Time Kinematic (RTK) GPS by surveyors from Minecomp Pty Ltd and are accurate to within 50 mm in three dimensions.

After the drill rig was set up on each hole, Macarthur staff checked the planned hole inclinations with a clinometer. Holes drilled prior to 2010 were downhole surveyed with a single-shot downhole camera lowered down the rod string, with surveys generally taken at 30 m intervals

All holes drilled after 2009 were surveyed with a GYRO tool. Surveys were conducted at sub-metre accuracy and composited into 5 m intervals before the results were entered into the drillhole database. For the 2019 drilling campaign, a drilling contractor supplied Reflex Sprint-IQ gyro tool was used with readings taken at a nominal spacing of 10 m.

10.3 Drillhole Logging

10.3.1 General

Diamond drill core and RC chip samples were geologically and geotechnically logged to a level of detail required to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Not all drillholes penetrated the BIF host units, but all were used to guide the geological interpretations supporting the Mineral Resource estimates.

All drillholes were geologically logged, using Microsoft Excel™ spreadsheets pre-formatted for use by Macarthur geologists, with lithologies, oxidation, structure, alteration, and mineralogy among the geological categories logged. Geological logging of drill samples was qualitative in nature for all RC drilling and diamond core samples.

10.3.2 Diamond Drill Core Logging

Diamond core drilling used mostly HQ diameter core with occasional PQ core depending on the mass of core required. Core orientation was performed using Reflex apparatus, which was unsuccessful for majority of core samples obtained from within the weathered rock profile.

The core from the diamond drillholes were geologically and geotechnically logged incorporating structural measurements, by contract geologists or Macarthur geologists. Figure 16 presents an example of diamond core from drillhole LGDD069 and shows the BIF host rock with magnetite mineralisation.

Figure 16: Diamond core sample from drillhole LGDD-069, 98.29 m to 101.56 m
Note: Magnetite layers (dark) and chert (light) can be seen.
Source: Macarthur (2020)

The structural orientation of a planar feature is defined by the alpha angle, which is measured by the core axis, and the beta angle which requires a bottom or top of the core axis defined by the orientation line. Although both the alpha and beta angles are required to calculate an orientation of the structural feature, if the strike of the feature is known, some information about the dip can be inferred from the alpha angle.

Diamond core recoveries were recorded by measuring the length of drill core retrieved per metre of drill penetration.

Core photography was undertaken for all diamond drilling, with one photo per core tray, ensuring all labelling is clear and visible.

10.4 Representative Drill Sections

Representative cross sections of the Moonshine deposit, showing the geological interpretation and drilling, are shown in Figure 41 to Figure 43 in Section 14.3.3.

10.5 Density Determinations

From the 2019 drilling program at Moonshine and Moonshine North, a total of 624 diamond core billets were selected for the measurement of density, with 400 of the samples logged as the BIF host rock unit. Samples were selected from unmineralised and mineralised BIF, and fresh and weathered BIF. The oxidised BIF is competent, exhibiting few fractures, vugs or voids which would normally necessitate the need to coat the core samples with paraffin wax prior to immersion in water for weighing. Therefore, the geological staff determined that the core samples did not require wax coating.

For the Clark Hill deposit, density measurements were taken from 122 diamond core billets sampled from four diamond holes, with 63 of the samples located within the BIF host rock. Density measurements were taken using a conventional Archimedes technique.

Further discussion is provided in Section 14.3.10 and Section 14.4.9.

Density measurements were carried out in the field camp by Macarthur staff using a conventional "Archimedes" procedure, where the samples were weighed in air and then weighed in water. The difference between weight (air) and when the sample is weighed in water equates to the mass of the displaced water and hence the volume of the core sample. The basic Archimedes formula used to calculate the density is:

$$Density = Weight\ (air)/(Weight\ (air) - weight\ (water))$$

Figure 17 shows diamond samples within a cage and attached to an overhead scale, prior to immersion in water.

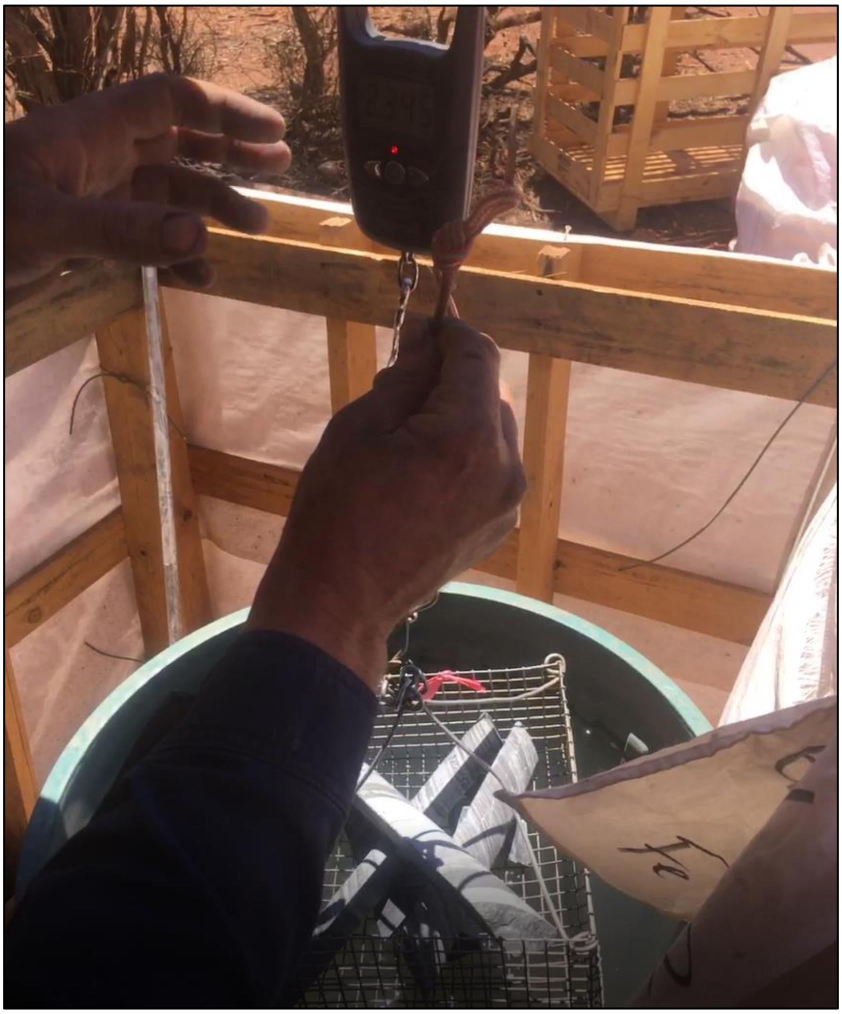

Figure 17: Dry core samples prior to immersion and weighing in water
Source: Macarthur (2020)

11 Sample Preparation, Analyses and Security

11.1 Field Sample Preparation, Handling and Security

11.1.1 Sample Handling and Security

Sample collection, handling and dispatch was of a high standard, with good practices employed throughout the process. Security tags were used at all steps of sampling and dispatch through to delivery at the relevant sample preparation and analytical laboratories.

Sample preparation for drillhole samples have followed consistent methodologies since drilling of the Project commenced in 2006. On completion of each hole the field assistants collect the samples and secure them in poly-weave bags using a cable tie labelled with a unique ID, which the lab would check upon receipt as a way of being aware of tampering. The poly-weave bags were securely stored in the Project exploration camp compound, where Macarthur personnel were present on a continual basis during the course of the drilling programmes.

The samples were transported to the assay laboratory depot in Kalgoorlie in a large bulk bag to avoid loss of samples, prior to being dispatched to the assay laboratory in Perth using a local courier company.

11.1.2 Reverse Circulation Sampling

Drilling practices are focused on maximising sample recovery and minimising sample contamination. For RC drilling, at the end of each 6 m drill rod, the drilling paused and compressed air was blown through the rods to flush cuttings from the drillhole, the sample hoses, and the cyclone to minimise sample contamination, and to ensure that there were no blockages in the sample stream. The cyclone was regularly inspected and cleaned as necessary. Samples were collected over 1 m downhole intervals and a subsample was collected in a calico bag by splitting through an industry standard three-tier riffle splitter. The splitter was calibrated for 75% of the sample passing 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 (Figure 18). The calico bag subsamples were labelled with the drillhole number and depth range and placed on top of the remnant bulk sample, which was placed in individual piles on the ground alongside the drill collar (Figure 19). All primary 1 m samples were submitted to the assay laboratory. Sample recovery is estimated from the appearance and volume of the primary sample, contained within its calico bag, and the remnant bulk sample.

Sample quality from RC drilling at the Lake Giles Magnetite Project has been judged by Macarthur and the QPs to be very good, with consistent recoveries and sample quality, such as dryness of sample.

Figure 18: Three-tiered splitter on an RC drill rig, showing collection of primary sample and field duplicate (sample residue is collected in the bucket)
Source: Macarthur (2020)

Figure 19: Drill samples laid out prior to collection and dispatch to assay laboratory
Source: Macarthur (2020)

11.1.3 Diamond Drilling Sampling

Diamond core drilling used mostly HQ diameter core with occasional PQ core depending on the mass of core required.

After the core was logged and sample intervals marked out by the geologist, the diamond core was cut using an electric core saw (Figure 20) for samples obtained from competent ground, or hand split when the core sample was unconsolidated, at either 1 m intervals or to geological contacts.

Figure 20: Diamond saw used for cutting diamond core, as used during the 2019 drilling program
Source: Macarthur (2020)

11.2 Laboratory Sample Preparation and Analyses

Samples from Sandalwood, Clark Hill North, Clark Hill South, and Snark were submitted to either Genalysis or Amdel Laboratories in Perth, Western Australia. Samples taken during the 2019 drilling program at Moonshine were dispatched to SGS Australia, located in Perth (Table 12).

Table 12: Independent laboratories used in the various drill programs

Laboratory	Location	Accreditation
Amdel Laboratories wholly owned by Bureau Veritas	6 Gauge Circuit, Canning Vale, Western Australia	ISO 9001 Quality Management System certification and NATA accreditation (Accreditation number 626)
Genalysis Laboratory Services wholly owned by the Intertek Group	15 Davison Street, Maddington, Western Australia	Accredited by NATA to operate in accordance with ISO/IEC 17025, which includes the management requirements of ISO 9001
SGS Australia Pty Ltd	431 Victoria Road, Malaga, Western Australia	Accredited with ISO 9001

All laboratories are accredited by the National Association of Testing Authorities (NATA) in accordance with ISO/IEC 17025, which includes the management requirements of ISO9001:2015. All the laboratories are independent of Macarthur.

All laboratories used over the course of the Project maintained sound security for all samples, from receipt of sample to storage of crush and pulp residue (limited storage time). Assay results were emailed to Macarthur.

Assays were performed on majority of single metre RC intervals and on selected diamond core intervals, averaging 1 m, while accounting for lithological boundaries. DTR analyses were performed on composited samples using lab bulk residues from the primary samples according to compositing instructions from Macarthur staff. The average composite length was 5 m, with geological staff grouping together intervals of similar character and setting boundaries at lithological changes, giving occasional composites between 2 m and 6 m in length.

Samples were delivered to the analytical laboratory where they were crushed to 3 mm, then pulverised to 105 µm (p95). The samples were subject to XRF analysis, with results provided for a suite of 25 elements, in addition to loss on ignition (LOI). Table 13 presents the elements or oxides analysed for head and concentrate grades, by analytical laboratory. Further detail for each laboratory is presented in Section 11.2.1 to 11.2.4.

Table 13: Laboratory analysis details

Analysis	Laboratory	Elements and oxides
Head grades	Genalysis	Au, Cu, Pb, Zn, Ni, Fe, Fe_2O_3, Co, K_2O, As, Ba, Cl, CaO, MgO, MnO, P, S, SiO_2, Al_2O_3, TiO_2, LOI
	Amdel	Ni, Fe, Al_2O_3, CaO, MgO, P, S, SiO_2, TiO_2, LOI
	SGS	Fe, Al_2O_3, SiO_2, Ba, Cr, Co, MnO, P, S, Pb, Cl, Sn, CaO, TiO_2, K_2O, Cu, As, Sr, MgO, Na_2O, Zn, V, Ni, Zr, H_2O, LOI
DTR and concentrate grades	Amdel	Fe, Fe_2+, SiO_2, Al_2O_3, TiO_2, CaO, MgO, P, S, Na_2O, K_2O, Cr, LOI
	SGS	Fe, Al_2O_3, CaO, Cr, K_2O, LOI, MgO, MnO, Na_2O, S, P, SiO_2, TiO_2, V, Ba, Co, Cu, Pb, Cl, Sn, As, Sr, Zn, Ni, Zr

Selected sample splits were ground to p98 45 µm and subjected to DTR testing with XRF analysis performed on head and concentrate material. A mass recovery estimate was calculated, which is the percentage of the sample that is considered recoverable by magnetic separation. The magnetite product is contained in this recovered fraction. A flowchart for this process at the Amdel laboratory can be seen in Figure 21 which is also considered to be representative for all XRF and DTR analysis procedures at the other analytical laboratories used.

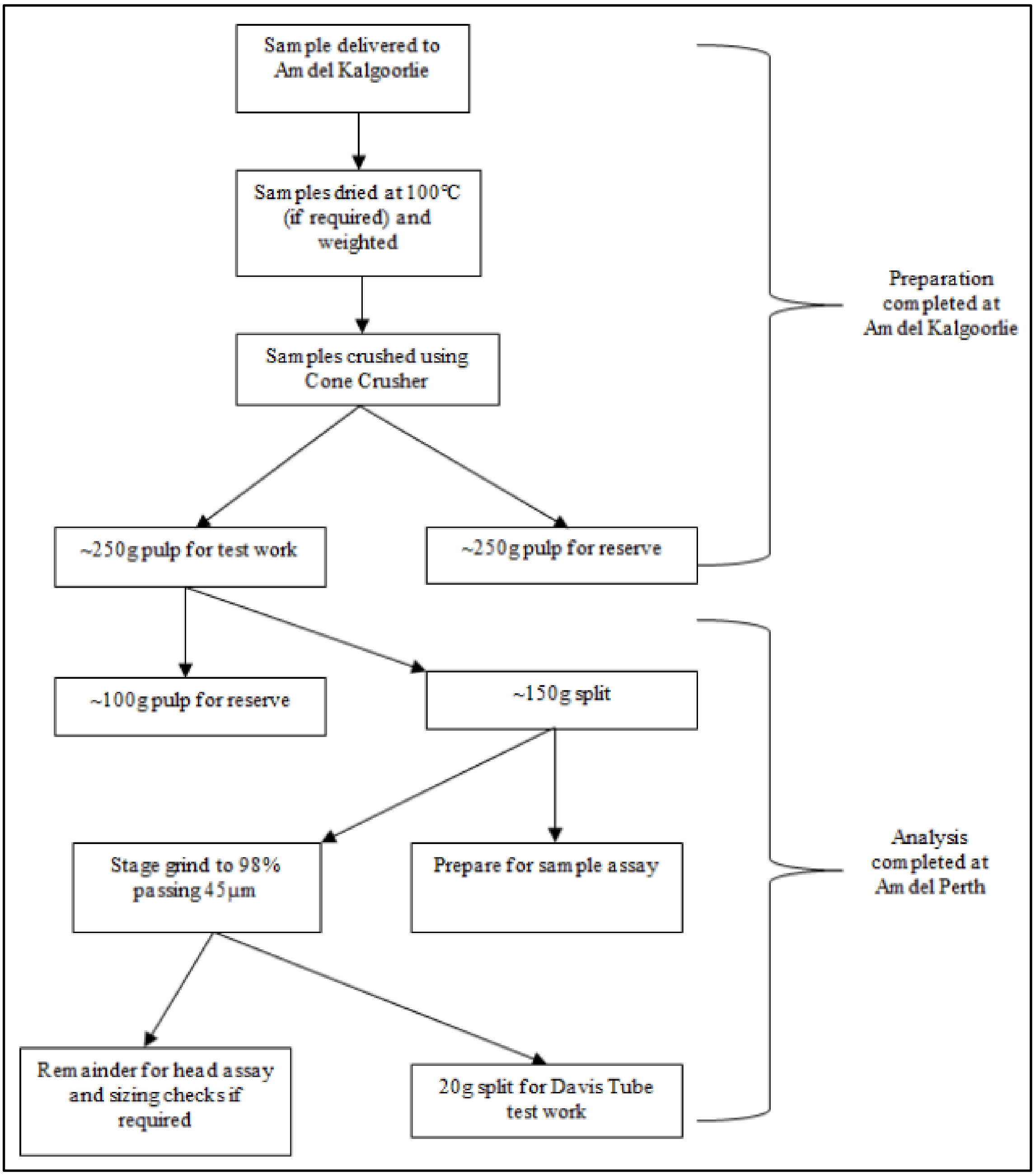

Figure 21: Flowchart of the analysis of sample at Amdel laboratory

Source: Macarthur (2020)

11.2.1 Genalysis Laboratory Services Pty Ltd

Head grade analyses of samples from 2006 were performed at Genalysis (Abbott et al., 2009b). These samples were sourced from the Sandalwood, Clark Hill North, Clark Hill South, and Snark prospects.

Genalysis' sample preparation procedure for the RC drill chips commenced with sorting and oven drying, followed by robotic sample preparation comprising crushing the entire sample to nominally 2 mm, and riffle splitting a 1 kg subsample, with the bulk residue retained. The 1 kg subsamples were pulverised to nominally 85% passing 75 microns and split into a 200 g subsample, and 800 g retained sample.

The samples were analysed by XRF in accordance with Genalysis procedure designated as "FUS1". Subsamples of the pulverised material were fused with a suitable flux and poured into a mould to produce a homogenous glass disc. Grades of the elements of interest (Table 13) were determined by simultaneous XRF.

11.2.2 Amdel

Head grade analyses for samples taken between 2007 and 2009 were performed at Amdel (Abbott et al., 2009b). The RC drill chip samples were initially sorted and dried at 105°C before being crushed to minus 3.5 mm using a Rocklabs Boyd Crusher, and subsequently pulverised in a ring mill.

The samples were analysed by XRF in accordance with Amdel procedure designated as “XRF4”. Subsamples of the pulverised material were fluxed with a lithium-metaborate flux and cast into a 30 mm diameter disc. Grades of the elements of interest (Table 13) were determined by simultaneous XRF using a Philips PW-1480 XRF spectrometer.

CRMs are fused with each batch of samples and are analysed as per the drillhole samples. Amdel also performed LOI analyses on a separate pre-dried portion of the sample in electric furnace set to 1,000°C.

11.2.3 Amdel Davis Tube Recovery Analysis

All DTR analysis of samples collected between 2006 and 2009 was completed by Amdel using 150 g subsamples split from the jaw-crushed residue samples, which were further pulverised to 45 µ with a ring pulveriser. The pulverised material was repeatedly wet sieved at 45 µ, and the coarse fraction reground until the oversize component was less than 5 g. A 20 g subsample was collected for DTR testwork.

The Davis Tube magnetic concentration procedure used a 25 mm diameter tube with a stroke length of 38 mm and a stroke frequency of 60 cycles per minute, with a magnetic field strength of 3000 gauss. The magnetic concentrate material was analysed by XRF for a range of elements using a procedure consistent with Amdel’s XRF analysis of head grade samples.

11.2.4 SGS Australia

Head grade, DTR analyses and concentrate grade analyses of samples from the 2019 drilling programme were performed at SGS Australia Pty Ltd (SGS). Samples were weighed upon receipt at the lab, dried at 105°C before being coarse crushed to a nominal 6 mm size, then a 3 kg split was dry pulverised to 85% passing 75µ. The sample was then fused in a platinum crucible using lithium metaborate/tetraborate flux and the resultant glass bead irradiated with x-rays and the elements of interest quantified. LOI was determined by a LECO thermo gravimetric analyser (TGA) at temperatures of 105°C, 371°C, 650°C and 1,000°C.

The DTR analyses used a 40 mm diameter tube with a stroke length of 38 mm and a stroke frequency of 60 cycles per minute, with a magnetic field strength of 3000 gauss. The magnetic concentrate material was analysed by XRF for a range of elements as detailed in Table 13 using a procedure consistent with SGS’s XRF analysis of head grade samples.

11.3 Quality Assurance and Quality Control

11.3.1 Overview and Summary of Methodology

QAQC practices and processes have been implemented by Macarthur for the drilling programs since 2006.

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 drillhole. Field duplicates were collected at a rate of 1:25 prior to 2019 and 1:20 in 2019. Pulp duplicates from pre-2019 drilling were also re-analysed in 2019 to test for analytical accuracy. A selection of pulp samples was also sent to Genalysis Intertek for umpire analyses of head grade XRF results.

The analytical 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 over the life of the drilling programs at the Project.

11.3.2 Blanks

No blank standards were used during the 2006–2009 sampling programs.

Macarthur employed the use of CRM GIOP-119 (refer Table 14) during the 2019 drilling campaign as a blank testing standard, with exceedingly low iron grade in comparison to expected grades encountered at the Lake Giles Magnetite Project. All 177 instances of the CRM test returned results within accepted ranges with no significant grade bias to report, as shown in Figure 22.

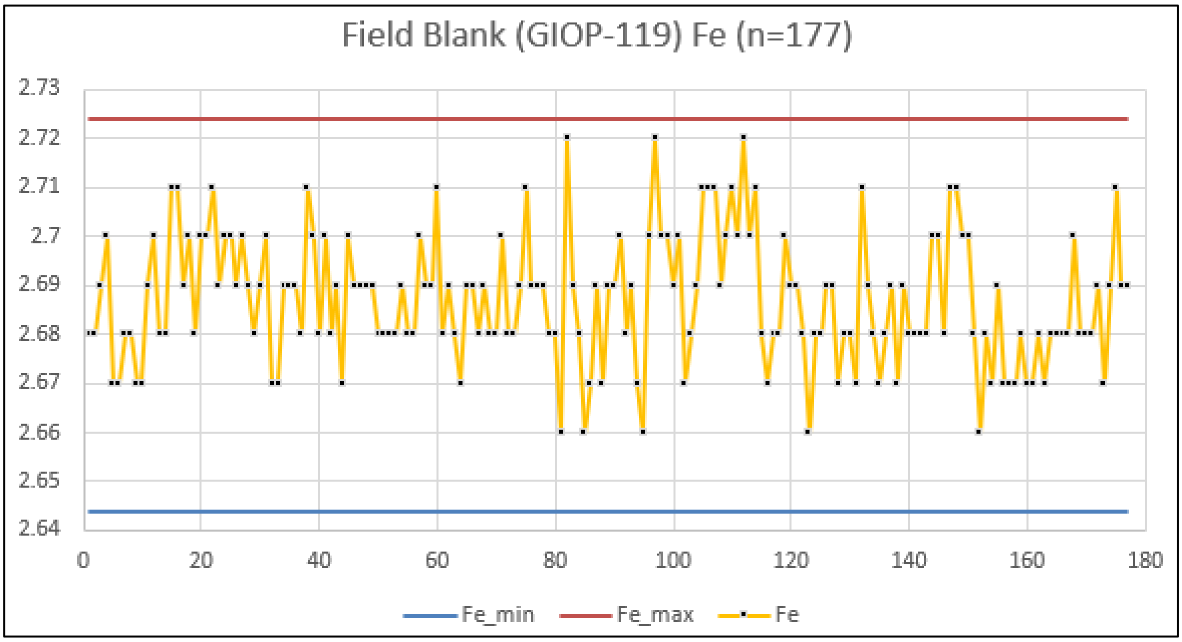

Figure 22: 2019 GIOP-119 blank testing, SGS
Source: Macarthur (2020)

11.3.3 Certified Reference Materials – Amdel 2007 to 2009 Drilling Programs

CRMs analysed at Amdel between 2007 and 2009 showed the majority of the assays falling within the expected ranges, as shown in Figure 23 and Figure 24. No CRM analyses were performed during the 2006 drill program.

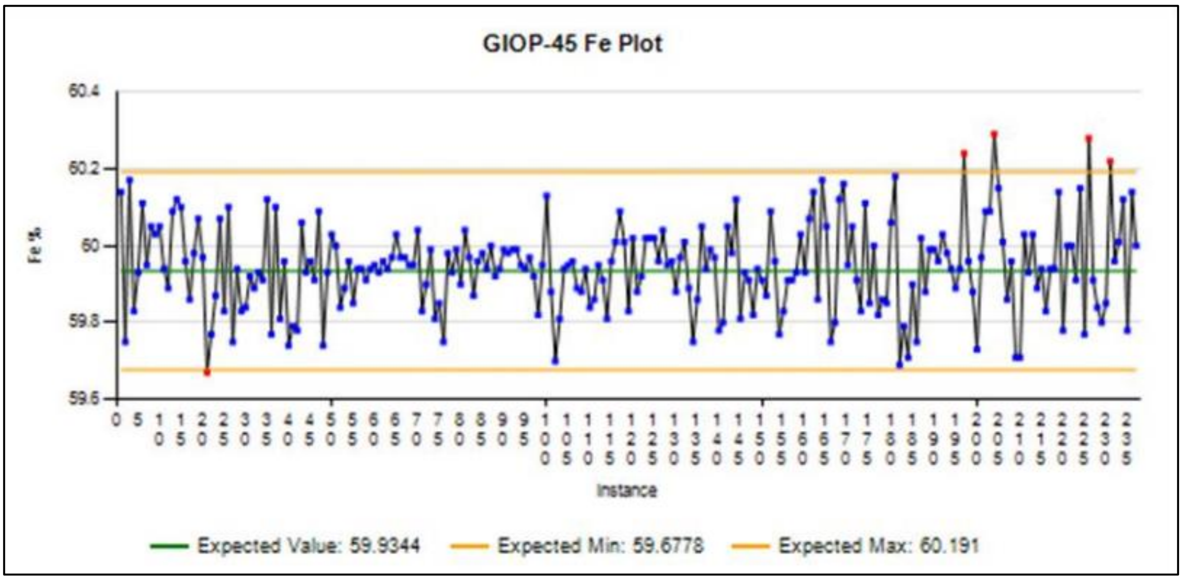

Figure 23: CRM performance chart for GIOP-45, Amdel (expected limits are ± 2 standard deviation)
Source: Macarthur (2020)

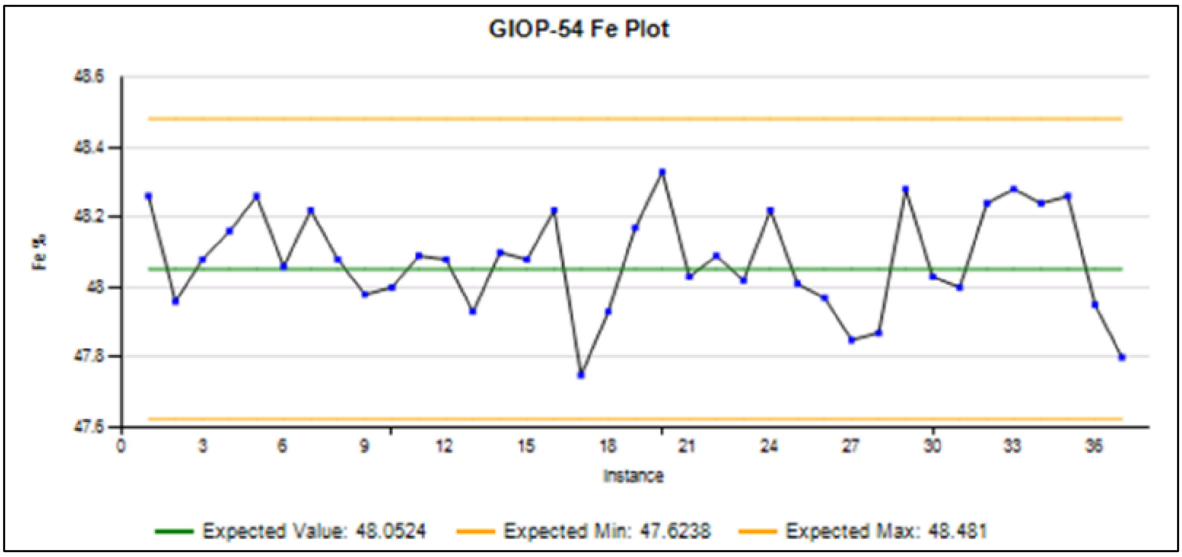

Figure 24: CRM performance chart for GIOP-54, Amdel (expected limits are ± 2 standard deviation)
Source: Macarthur (2020)

11.3.4 SGS Australia – 2019 Moonshine Drilling Program

The 2019 Moonshine drilling campaign used eight different CRMs supplied by Geostats Pty Ltd. A total of 369 CRM samples were assayed by SGS. A short summary of the overall results are presented in Table 14 and Table 15. Selected CRM performance charts are presented in Figure 25 to Figure 27. In general, the 2019 drilling campaign's CRM testing was successful and within expected ranges for majority of samples tested.

Analysis of laboratory results showed that sample GIOP-102 showed some strong negative biases in iron and silica, a low negative bias in phosphorous and a strong positive bias in LOI, with the remaining elements in close range to expected averages. Macarthur notes that an internet search for other projects using GIOP-102 also reported iron and silica analyses below the expected range. It is recommended that Macarthur discontinue use of this CRM.

Table 14: CRM summary data 1/2

CRM	No. tested	Fe			Al2O3		
		Expected mean	2σ error range	Mean	Expected mean	2σ error range	Mean
GIOP-102	57	25.60	0.18	25.28	2.051	0.102	2.04
GIOP-111	30	33.35	0.3	33.17	0.2213	0.0162	0.22
GIOP-118	40	71.51	0.26	71.47	0	0	0.01
GIOP-119	177	2.68	0.04	2.69	0.0264	0.02	0.01
GIOP-134	5	47.52	0.2	47.50	9.953	0.15	9.87
GIOP-135	17	53.51	0.16	53.46	7.322	0.104	7.26
GIOP-142	22	56.58	0.28	56.57	3.032	0.05	3.02
GIOP-45	21	59.93	0.26	59.92	2.024	0.062	2.01

Table 15: CRM summary data 2/2

Standard	SiO2			P			LOI expected mean
	Expected mean	2σ error range	Mean	Expected mean	2σ error range	Mean	
GIOP-102	53.35	0.52	52.81	0.0758	0.0026	0.074	-0.194
GIOP-111	48.26	0.34	48.05	0.0674	0.0028	0.066	-1.069
GIOP-118	0.76	0.074	0.76	0.0058	0.0024	0.006	-3.857
GIOP-119	86.05	0.5	86.05	0.1225	0.003	0.120	0.634
GIOP-134	13.47	0.13	13.48	0.0577	0.002	0.057	4.452
GIOP-135	9.63	0.108	9.61	0.05917	0.00178	0.059	3.562
GIOP-142	6.70	0.062	6.71	0.0412	0.0024	0.041	8.368
GIOP-45	4.99	0.09	4.99	0.0505	0.0022	0.050	6.615

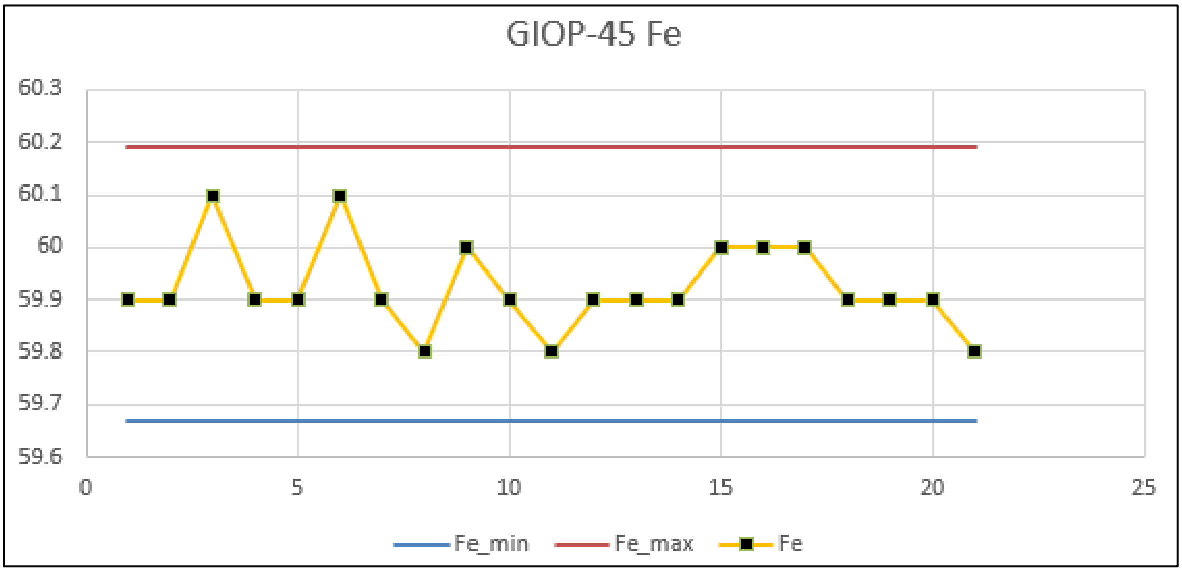

Figure 25: CRM performance chart, GIOP-45 (Fe)
Source: Macarthur (2020)

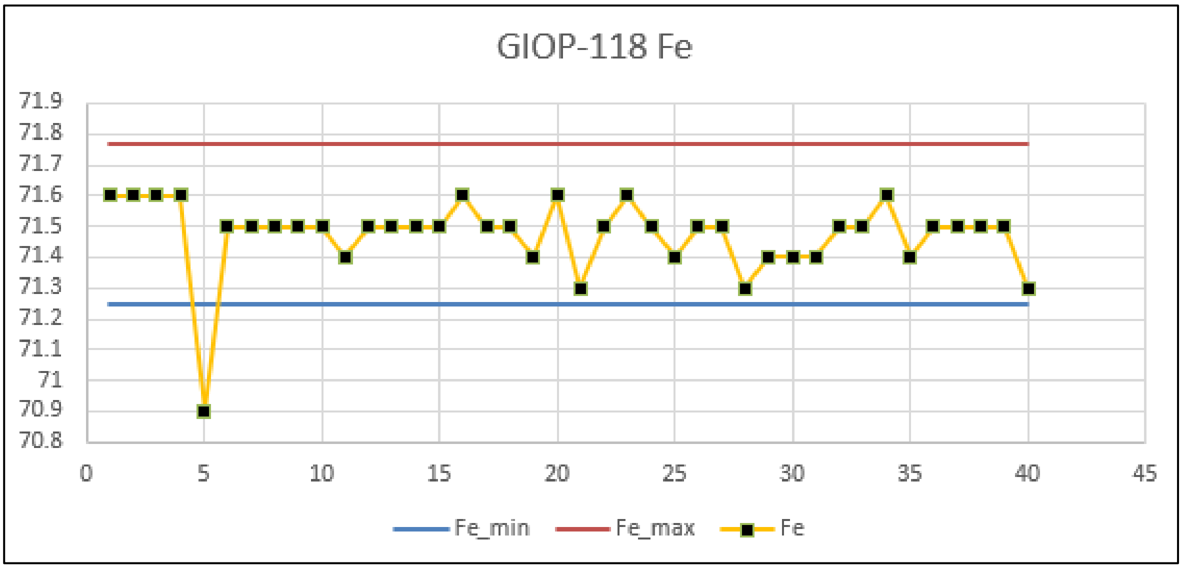

Figure 26: CRM performance chart, GIOP-118 (Fe)
Source: Macarthur (2020)

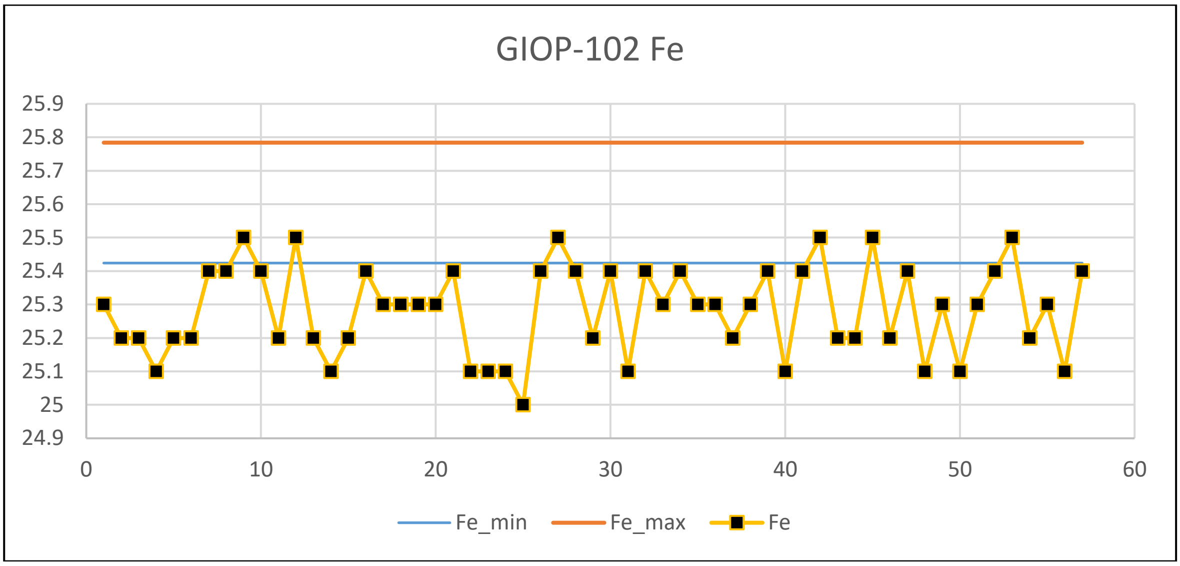

Figure 27: *CRM performance chart, GIOP-102 (Fe)*
Source: Macarthur (2020)

11.3.5 Field Duplicates

A number of field duplicates were tested as part of drilling programs at the Lake Giles Magnetite Project. Scatter plots for Fe (%) are presented in Figure 28 and Figure 29. These demonstrate a tight clustering around the 1:1 line, although there are outliers. These outliers may be due to misallocation of field duplicate samples (sample bags erroneously labelled) or sampling bias at the drill rig. A very high correlation coefficient (0.99) implies sampling at the drill rig was maintained at a high level of proficiency.

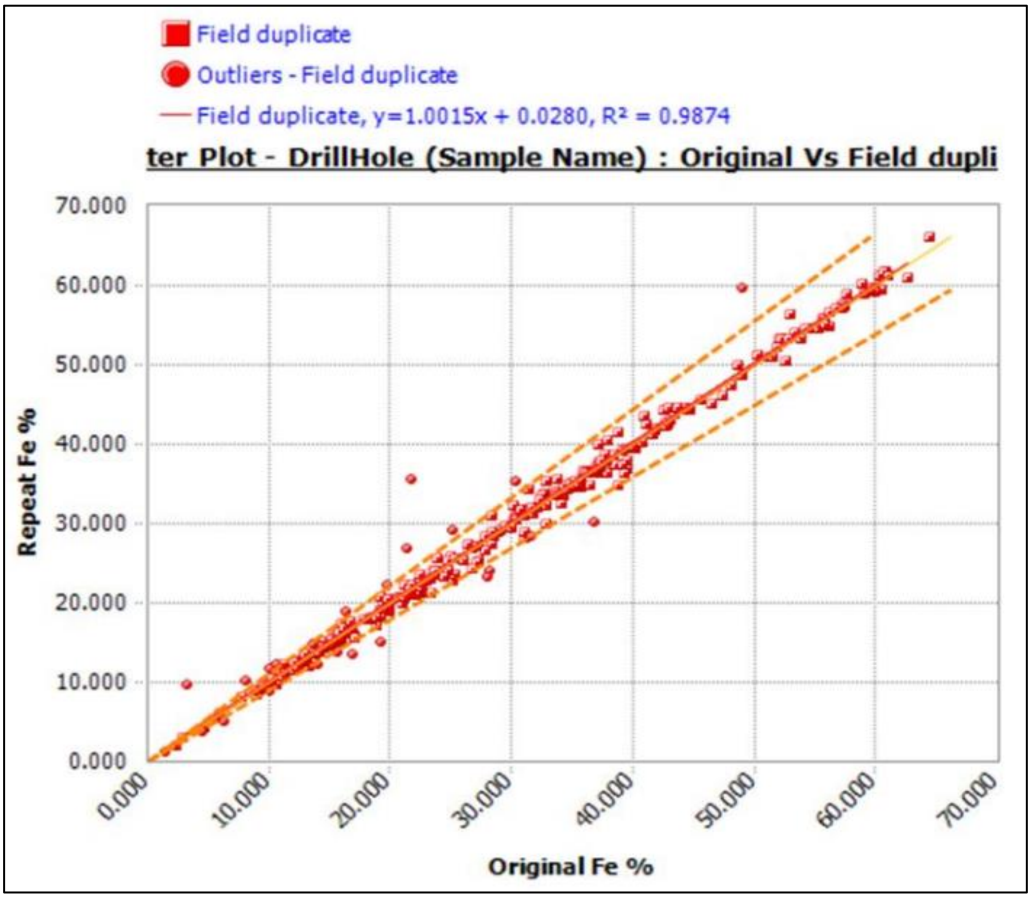

Figure 28: *Field duplicate testing, Amdel*
Source: Macarthur (2020)

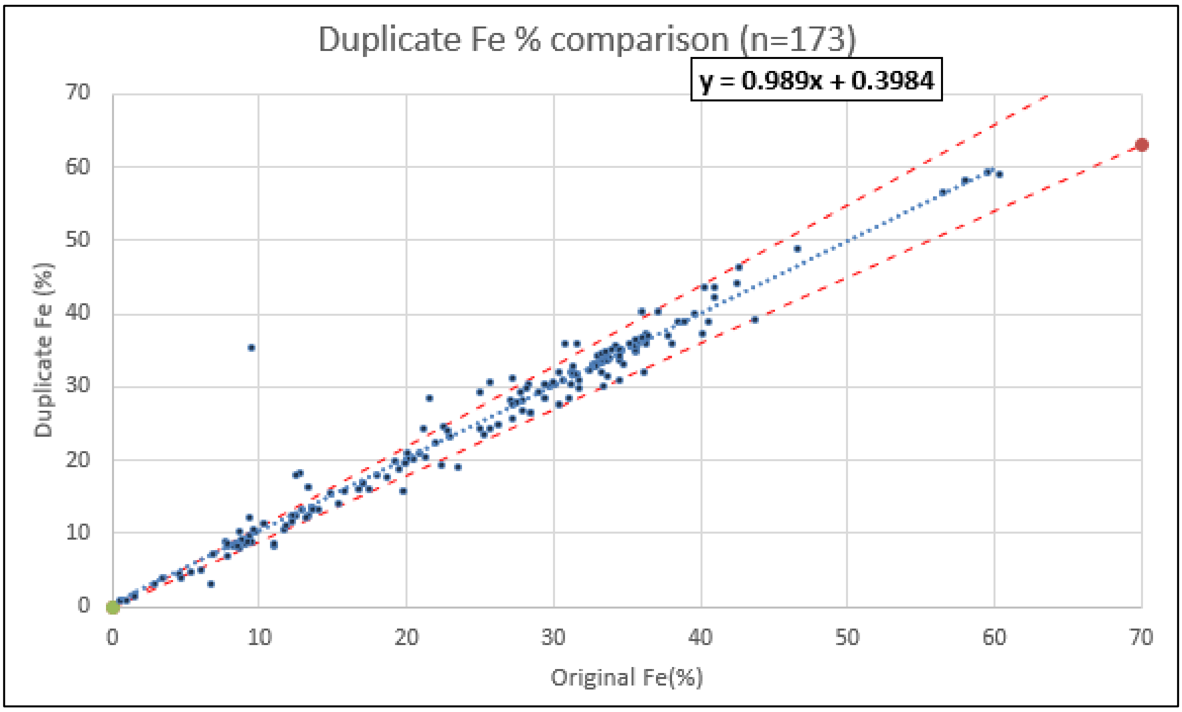

Figure 29: 2019 Field duplicate testing, SGS
Source: Macarthur (2020)

11.3.6 2006–2013 Pulp Duplicates

During the 2019, Moonshine drilling campaign a total of 101 pulp residue samples from drilling conducted between 2006 and 2013 were submitted to SGS to compare the assays against the original head XRF assay values for consistency.

Samples were selected in order to represent a variety of holes and grades from both Moonshine and Moonshine North, especially around the central portions of the resource.

The samples chosen had been stored as pulps in boxed sealed packets in sealed sea containers at the Lake Giles sample storage compound. The packets were assigned new sample IDs and dispatched to SGS along with samples from the 2019 drilling program with appropriate security tags.

The selected samples included pulps tested at Amdel. Assays of the pre-2019 pulps has shown very consistent and repeatable results for all samples tested (n=101) with a sub-1% error range (resulting in 0.5% Fe grade difference at 50% Fe) and no significant grade bias shown by SGS assaying compared to Amdel. Scatterplots for Fe, SiO_2 and LOI are presented in Figure 30 to Figure 32.

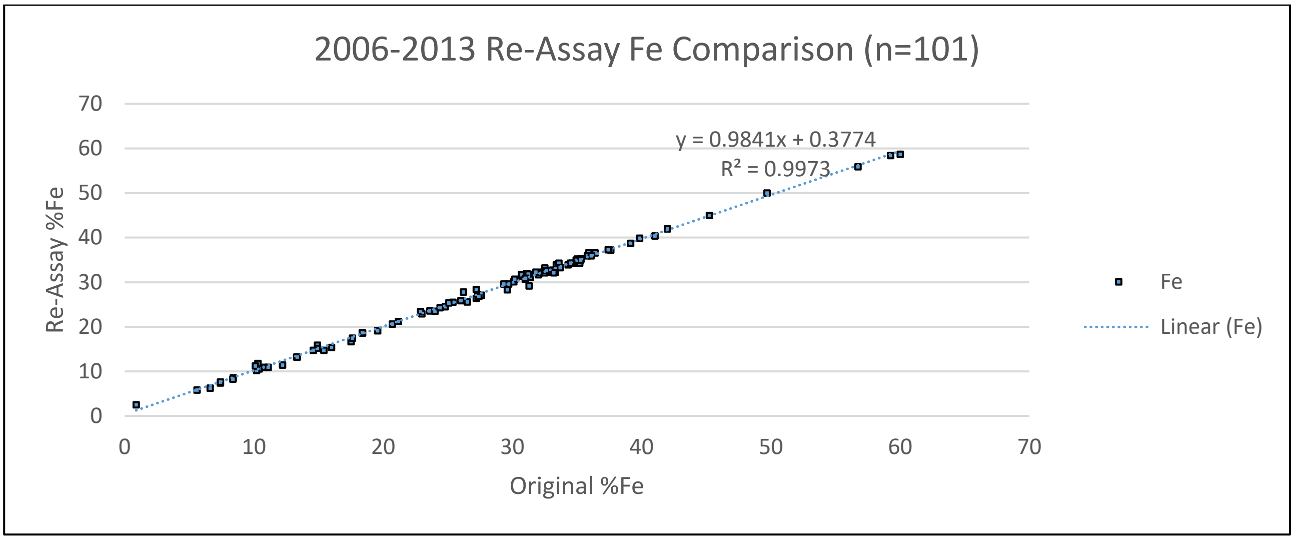

Figure 30: Scatterplot, original (Amdel) assays vs pulp repeats, Fe %
Source: Macarthur (2020)

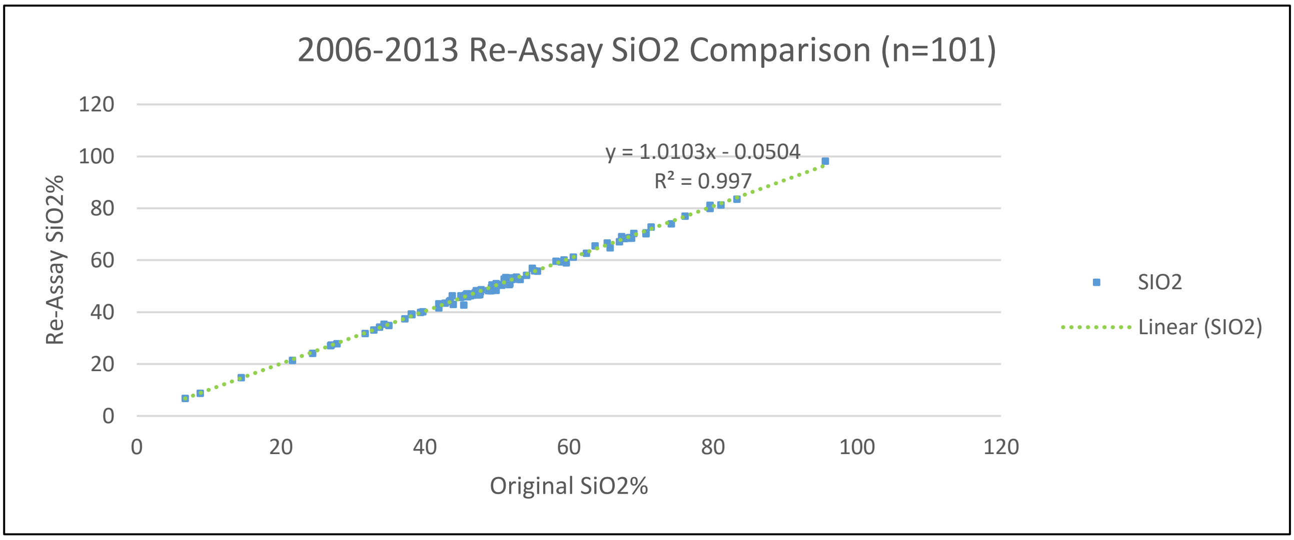

Figure 31: Scatterplot, original (Amdel) assays vs pulp repeats, SiO_2 %
Source: Macarthur (2020)

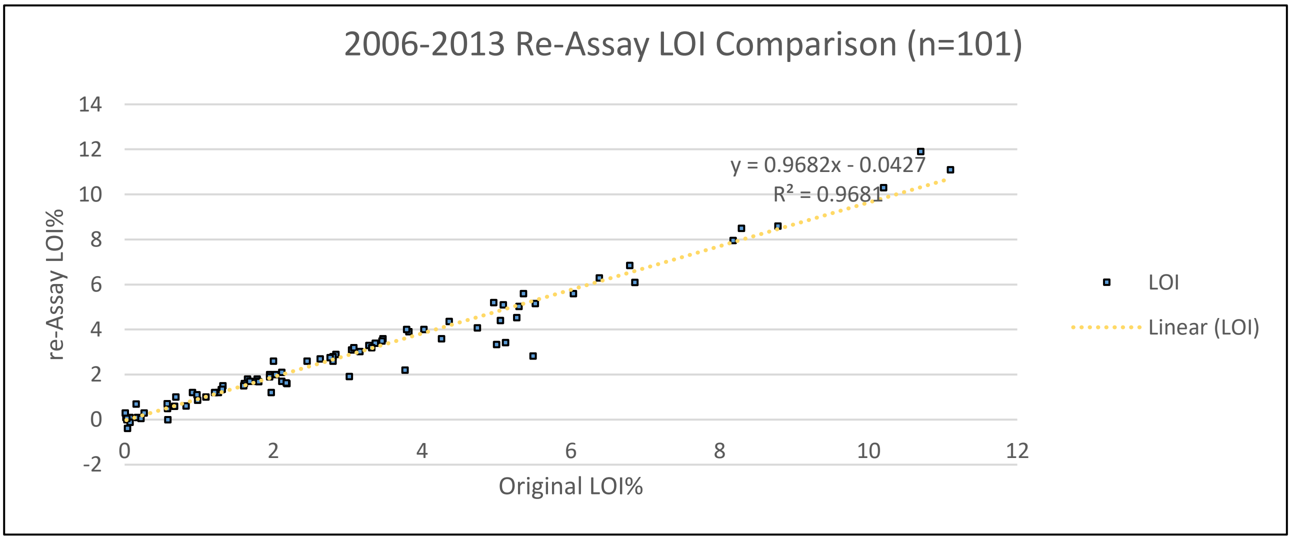

Figure 32: Scatterplot, original (Amdel) assays vs pulp repeats, LOI %
Source: Macarthur (2020)

11.3.7 Umpire Assay Results

The 2019 Moonshine drilling campaign sent a total of 148 samples to Intertek Laboratory in Perth for umpire testing of head XRF grades.

Samples for umpiring were selected by Macarthur and requested as pulps from the bulk samples held at SGS, then delivered to Intertek. Intertek assayed the samples using their FB1/XRF (lithium borate fusion) method for elements and TGA method for LOI.

Figure 33 shows a scatterplot of Fe % from the umpire analyses. Results from this and other elements showed no grade bias towards either laboratory and therefore support the use of the SGS sample analyses in the Mineral Resource estimate.

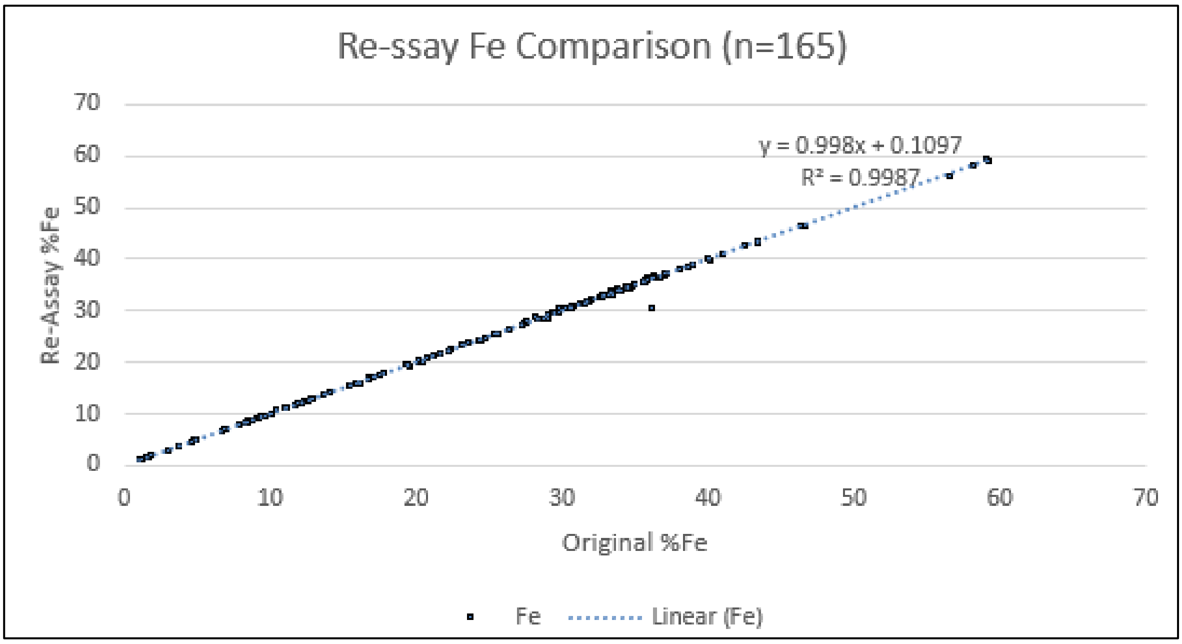

Figure 33: Scatterplot of Fe %, SGS vs Intertek analyses, Moonshine 2019 drill program
Source: Macarthur (2020)

11.3.8 Laboratory Internal Testing

As part of their normal analytical operations, laboratories often perform internal duplicate testing of splits from the bulk 105 µm sample as a means of testing the XRF apparatus. Certain laboratories also include their own standards and blanks on a regular basis and include the results in the results being sent to the client. Analysis of all laboratory testing suites for all laboratories used over the lifetime of the Project have shown excellent consistency and have not raised any issues of concern for Macarthur.

11.4 Qualified Person's Opinion

The author is of the opinion that the sample preparation, sample security and analytical procedures are of industry standard and are adequate to support the Mineral Resource classification disclosed in this report.

12 Data Verification

12.1 Site Inspection

Mr Nikolay Karakashov, independent contract geologist to Macarthur, visited the property between 9 and 10 September 2020 in the company of Dr Dean Carter, General Manager, Macarthur. While on site, Mr Karakashov inspected the overall geology of the Project including outcropping magnetite mineralisation of the Moonshine, Moonshine North, Sandalwood, Clark Hill North, Clark Hill South, and Snark deposits. Representative drill core and RC chips of mineralised intervals from the deposits were inspected. Multiple drillhole locations were visited and collar coordinates for 28 drillholes were surveyed with a handheld Garmin GPS device, with an accuracy of ± 3 m on the GDA94 grid system. In all cases, the surveyed collar coordinates were confirmed. Some historical collar locations were only estimated, due to the extensive rehabilitation of the drill sites, as seen in Figure 34 and Figure 35. In all cases, the surveyed collar coordinates were confirmed.

Mr Karakashov also appraised the local infrastructure including the quality of access to the Project site, and the proximity of the Project to adjacent properties hosting advanced projects.

Table 16 shows the results of hole location checking, showing a good average error range.

There were no negative outcomes from the site inspection.

Table 16: Collar coordinate location checking 9–10 September 2020

Hole ID	Measured east	Measured north	Database east	Database north	Deviation distance
LGRC_0027	787,769	6,693,914	787,765	6,693,913	1.3
LGRC_0032	787,584	6,692,501	787,583	6,692,500	0.8
LGRC_0082	791,371	6,687,998	791,368	6,687,997	1.4
LGRC_0102	789,185	6,691,476	789,182	6,691,470	6.3
LGRC_0103	789,174	6,691,687	789,170	6,691,686	1.2
LGRC_0104	789,134	6,691,917	789,133	6,691,913	4.2
LGRC_0105	790,119	6,672,306	790,123	6,672,306	0.3
LGRC_0113	789,376	6,673,092	789,378	6,673,100	8.3
LGRC_0199	790,755	6,671,360	790,756	6,671,362	2.3
LGRC_0203	787,982	6,674,757	787,980	6,674,758	0.8
LGRC_2148	790,085	6,672,302	790,086	6,672,302	0.6
LGRC_2152	790,346	6,671,769	790,345	6,671,765	4.4
LGRC_2165	787,888	6,674,858	787,894	6,674,856	1.3
LGRC_0225	787,945	6,675,127	787,949	6,675,123	3.7
LGRC_0236	787,967	6,675,138	787,971	6,675,134	4.1
LGRC_0266	791,039	6,671,116	791,042	6,671,116	0.3
LGRC_0271	787,737	6,675,301	787,738	6,675,296	5.0
LGRC_0273	787,645	6,675,605	787,647	6,675,600	4.2
LGRC_0368	791,601	6,687,199	791,598	6,687,199	0.3
LGRC_0431	787,950	6,674,752	787,948	6,674,749	2.9
LGRC_0084	791,104	6,688,759	791,100	6,688,755	5.2
LGRC_0088	790,753	6,689,573	790,750	6,689,568	4.8
LGDD_066	790,221	6,672,153	790,218	6,672,154	0.4
LGDD_071	787,936	6,674,893	787,942	6,674,887	5.6
LGWE_013	788,043	6,674,578	788,041	6,674,575	2.4
18MNRC001	788,030	6,674,942	788,035	6,674,937	4.7
LGWE_042	791,169	6,690,791	791,175	6,690,795	4.6
LGWE_043	791,107	6,690,742	791,105	6,690,738	3.4
				Average	3.0

Figure 34: Location of LGRC_0038 in Clark Hill South (showing drill cuttings) at estimated collar location

Figure 35: An example of rehabilitation extent at a historical drill site (LGRC_0021) in Clark Hill North

Mr Karakashov was involved in the 2010 and 2011 RC and diamond drilling campaigns at the Moonshine and Moonshine North prospects. Mr Karakashov was satisfied with drilling, sampling and QAQC practices at the time. Sample quality was predominantly satisfactory, with any sample recovery issues dealt with immediately. Majority of the samples obtained within the mineralised domains were of good quality and consistency.

Planned drillholes orientations were also raised as an issue in 2011, due to the strongly varying magnetic field direction in the vicinity of major magnetite BIF ridges, sometimes causing deviation of the north direction by over 40°. Mr Karakashov proposed an alternative procedure for lining up drill rigs proximal to magnetite BIF ridges by pegging sighter pegs using a GPS device, and taking a back-bearing located at least 200 m away from the drillhole to minimise GPS error to within 5°. A second sighter peg was then placed at the drill site. The procedure was adopted for all affected areas thereafter. Drilling orientation prior to this procedure did not pose an issue as all drillholes were later surveyed with a gyro tool, superseding any handheld compass orientations. Drilling also remained closely perpendicular to the BIF ridges with all drillhole orientations estimated on BIF outcrop orientation, as opposed to pre-planned cardinal directions.

12.2 Data Verification and Validation

12.2.1 Sample Dispatch, Handling and Data Collection

Sample collection, handling and dispatch was of a high standard, with good practices employed throughout the process. Security tags were used at all steps of sampling and dispatch through to delivery at the relevant testing labs.

Prior to 2019, sampling data was stringently collected at all steps of the process and logged on paper with subsequent validated data entry into a secure relational database package, maintained by Macarthur staff. The operational database then exported packages of data, which were validated and entered by CSA Global into Macarthur's database, fully maintained and operated by CSA Global. Exports of the data were then supplied to Macarthur and checked by field staff, when relevant. A summary of these procedures can be seen in Figure 36.

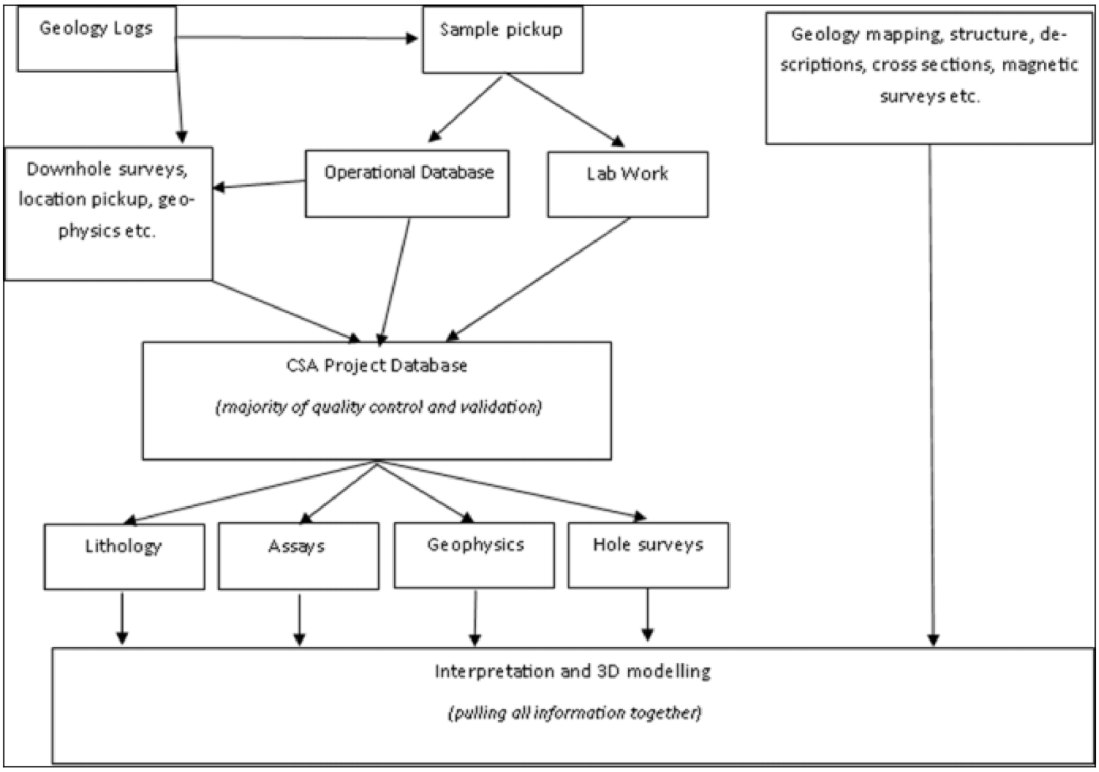

Figure 36: Diagrammatic summary of data management at Lake Giles Magnetite Project prior to 2019
Source: CSA Global (2020)

For the 2019 drilling campaign at Moonshine and Moonshine North, sampling, dispatch and data generation was done entirely by Macarthur staff and contractors. Detailed procedures for drilling, sampling and collection of data were provided by field supervisors and appear to have been followed to a satisfactory level. Drilling, logging and sampling data was provided in digital format as a series of spreadsheet templates, which were collated by Mr Karakashov. The field data then underwent stringent quality control, utilising a variety of industry standard techniques for verifying exploration data before being imported into a relational database, constructed and maintained by Mr Karakashov.

A small number of corrections to original field data (e.g. fixing typographical errors, incorrect dates of sample collection, incorrect sample ID assignments) were performed and fully logged into a separate document, for future reference. Any other data was entered directly into the database with no alteration. Copies of the original field data were also stored and reviewed by the Project geologists.

The Lake Giles Magnetite Project currently has two separate databases for exploration, one for pre-2019 data, and the other capturing data from the 2019 drilling program. The 2019 drilling and sampling data was stored in a unique database to manage QAQC protocols and correcting any errors in the database, without affecting the pre-2019 database which was validated and deemed fit for use to support the previous non-current Mineral Resource estimates for the Lake Giles Magnetite Project.

The two databases contain compatible data, allowing merging of the database tables at the Mineral Resource estimate stage, as discussed in Section 14.3.1. It is recommended that Macarthur merge both databases with associated database validation and data security procedures prior to future updates to the Mineral Resource estimates.

12.2.2 Laboratory Analyses and QAQC

Prior to 2019, all assays and QAQC data associated with the Lake Giles Magnetite Project was managed by CSA Global as part of their maintenance of the Project database. As such, all relevant industry standard quality controls and data aggregation methods were employed and applied on incoming data. Macarthur staff were also supplied with both raw data from lab dispatches, as well as exported assays, which were then widely used in internal geological modelling, as well as cross referencing to original field data (e.g. in cases of sample duplicate IDs or expected sudden changes in grade). Assay data was deemed of good quality and no major issues were raised at the time.

The 2019 drillhole database incorporates laboratory analyses and QAQC results from the 2019 drilling campaign, and also includes the 30 drillholes drilled up until 2010, as well as laboratory repeats from 26 holes drilled prior to 2019. QAQC data included CRMs, duplicate and blank testing, lab umpiring comparison, as well as internal laboratory tests as detailed in Section 11.3.

Data manipulation of primary data was minimal and aimed at converting non-numeric results into useable numeric values. Actions included:

- Converting all below detection limit (usually represented as negative) values to 0 or half of the lower detection limit.
- Assigning values of -9999 for missing data, -8888 for unreported data, -5555 for insufficient sample quantity and -1111 for over detection limit samples. The values could then be excluded from any estimations and analysis. This data manipulation step was applied to the pre-2019 drillhole database.
- Conversion of non-assayed values to null.

Laboratory results from SGS and Intertek (as part of umpiring, discussed in Section 11.3.7) was sent directly to Macarthur and was subsequently verified before being included in the database. Several sample dispatches from SGS showed inconsistencies with some of the calculated values returning erroneous results. The batches in question were returned to SGS and promptly rectified, leaving no outstanding data issues relating to assay results.

Upon receipt of the entirety of QAQC data Macarthur noted several mismatches between expected and returned values for a handful of CRM samples. Due to their close match to other CRMs used in the program and the high apparent quality of testing on SGS's part, a decision was made to amend the database to reflect these changes and reassign the CRM IDs to the expected ones. A record of these changes was maintained in the relevant spreadsheet. It is likely the error was caused by inserting the incorrect CRM packet in the field by the field assistants. All remaining QAQC data received and verified by Macarthur was of adequate quality to support Mineral Resource estimates.

No drillholes were excluded from the Mineral Resource estimate.

12.2.3 Twin Drilling

A total of two diamond drillholes in Moonshine North partially twinned existing RC holes. Twinning was planned for the purpose of increasing geological confidence in creating metallurgical sample composites from the two prospects without sacrificing extra core, as well as verifying the consistency of downhole geology across short distances. The twinned hole pairs were LGRC_0276 with LGDD_052 for the first 50 m and LGRC_0222 with LGDD_005 for the first 54 m.The twinned sets intersected the footwall and hangingwall contacts of the Moonshine North East 1 lode bearing BIF respectively and were located approximately 100 m apart along strike of the main BIF unit.

Limited assay data is available for the LGDD_052 twinned interval, as only a few samples were selected for assaying by the supervising geologist. The assays indicate close correlation associated with the rapid decrease in iron grade at the footwall contact. A simple comparison can be seen in Figure 37 to Figure 39.

No assay data is available for LGDD_005 as the core was composited into a larger metallurgical sample, with no metre-scale assaying being performed.

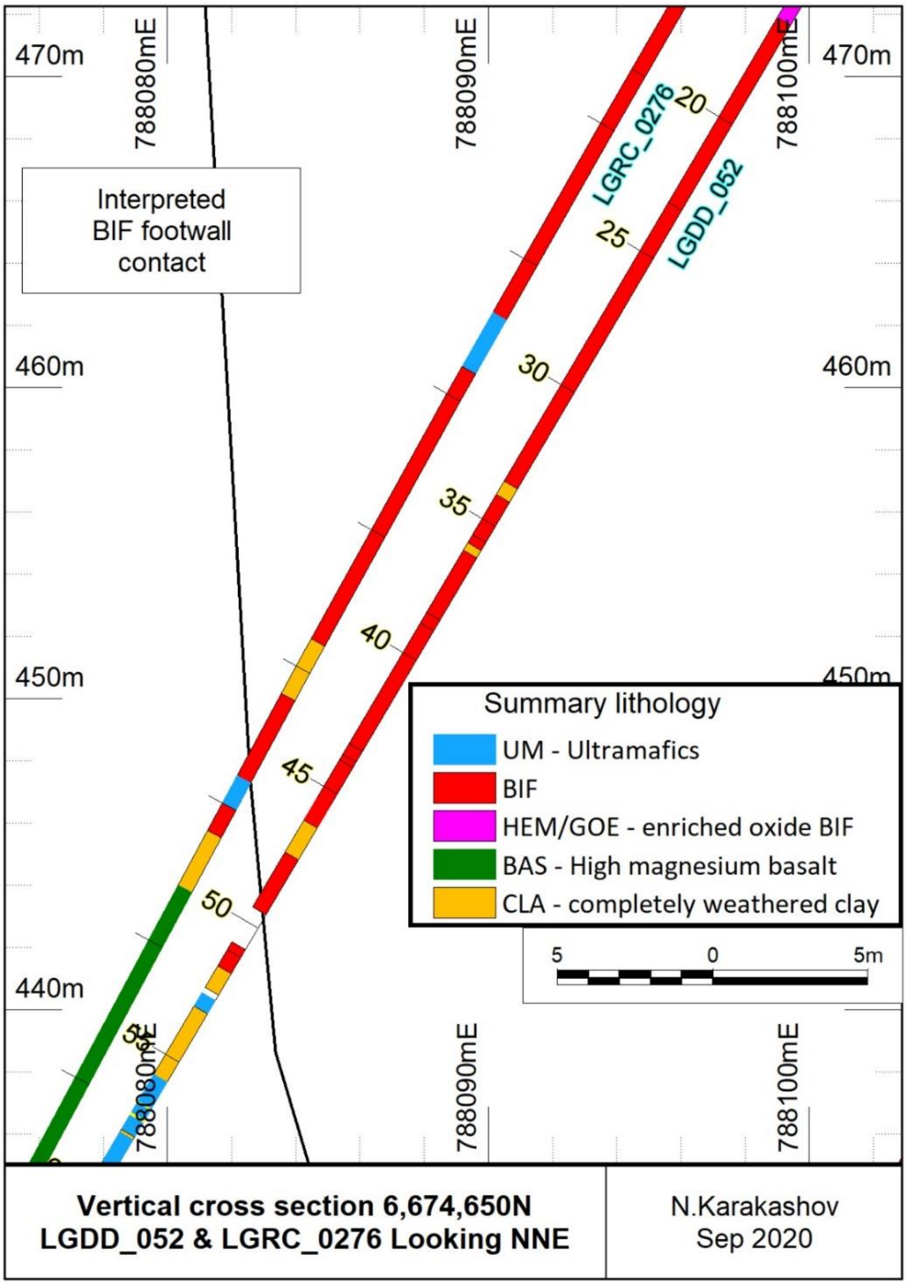

Figure 37: Lithological logging for LGDD_052/LGRC_276 pair
Source: Karakashov (2020)

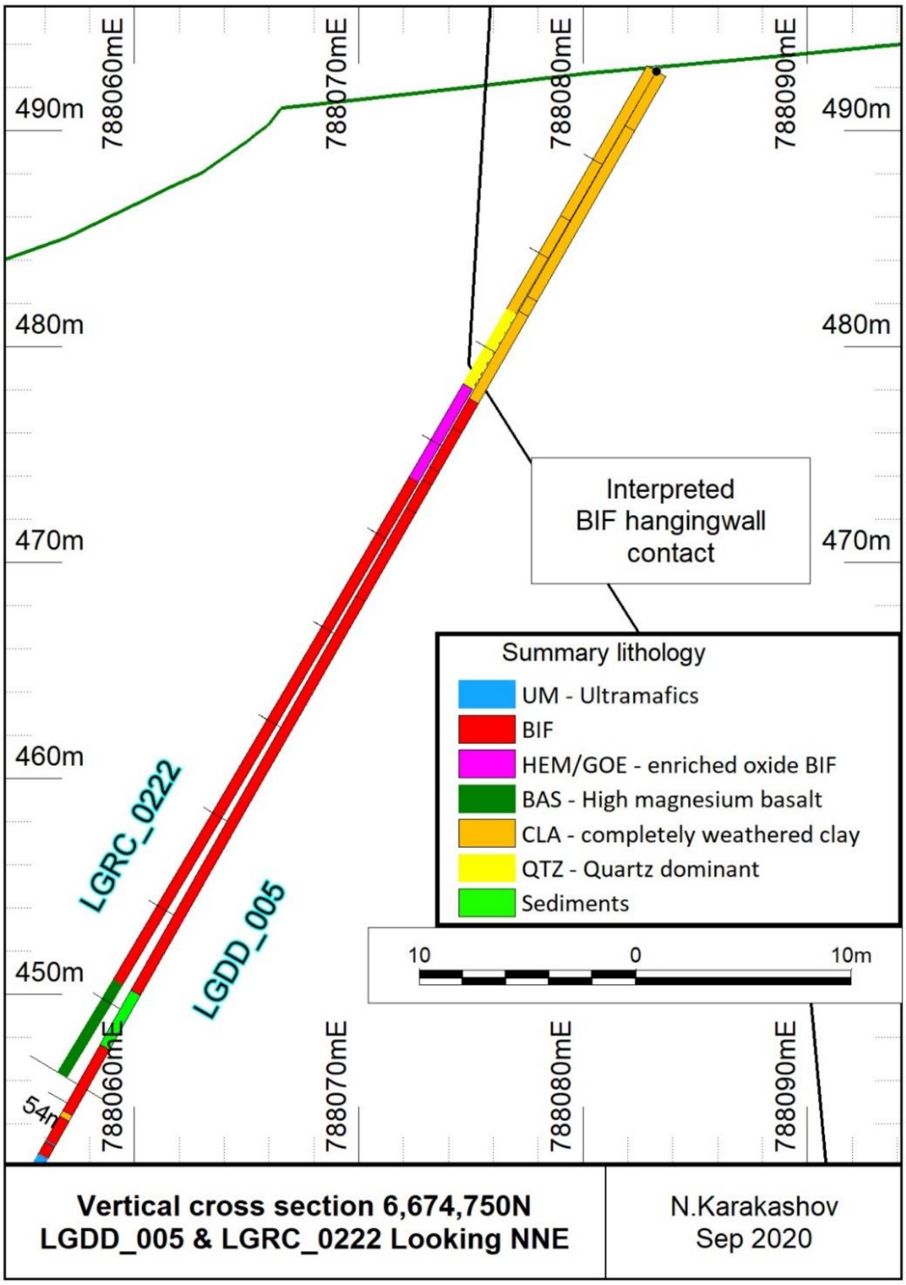

Figure 38: Lithological logging for LGDD_005/LGRC_222 pair

Source: Karakashov (2020)

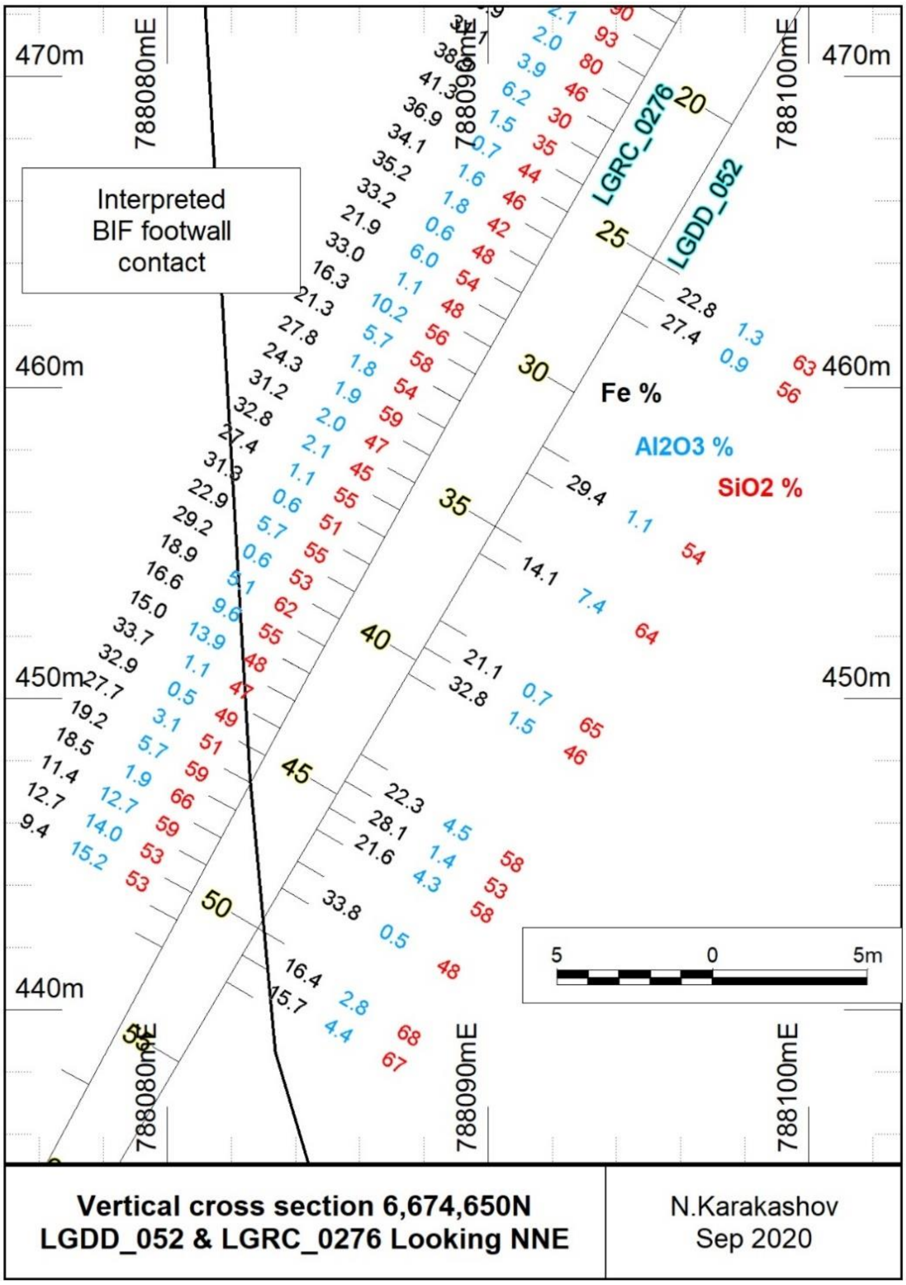

Figure 39: Assay comparison for LGDD_052/LGRC_276 pair
Source: Karakashov (2020)

12.2.4 Audits and Reviews

No independent audits or reviews of the drillhole database and QAQC results have been carried out, apart from current and previous reviews of data conducted by the QPs at the time of reporting of Mineral Resources.

12.3 Opinion of Qualified Person

The QP is of the opinion that the drillhole and sample data is adequate for use in the Mineral Resource estimates disclosed in this report.

13 Mineral Processing and Metallurgical Testing

13.1 Previous Metallurgical Testwork

Promet (2008) carried out a preliminary metallurgical study based on samples from 14 RC holes drilled at Clark Hill North, Clark Hill South, and Snark deposits. The main outcomes from this work are:

- The iron grade of the metallurgical test sample intervals and the Davis Tube mass recovery of the metallurgical samples supplied to Promet were higher than the bulk of the intervals used for Mineral Resource estimates (Allen, 2009). This indicates that the samples were selected from the best (high) grades rather than representing the average of the grade of iron in the mineralisation.
- The silica grades of the recovered concentrate in Promet's testing were higher than 10%, despite grind sizes down to 25 µ. In contrast, the drill sample DTR assays showed a majority of results <10% SiO_2, averaging 9.9% in samples from the eastern magnetite domains, and 6.6% in the western lodes.
- A reverse flotation test showed that for the 25 µ grind, a concentrate of <5% SiO_2 can be achieved at a product weight recovery of 65%.

Engenium (2010) carried out preliminary studies based on samples from two RC holes (LGRC199 and LGRC203) from the Moonshine and Moonshine North deposits. The main conclusions were:

- The iron head grades from the metallurgical test samples and the DTR concentrate grade were higher than the bulk of the intervals used for the Mineral Resource estimate (Snowden, 2011)
- 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.
- DTR concentrate grades for silica from both holes were ~ 5%; however, the LIMS test did not achieve this grade in hole LGRC199.

CSA Global recommend Macarthur carry out comprehensive studies to understand the metallurgical characteristics of the Moonshine, Moonshine North, Sandalwood, Clark Hill North and South, and Snark magnetite mineralisation, to support the reporting of future Mineral Resource estimates.

14 Mineral Resource Estimates

14.1 Summary

The Moonshine and Moonshine North Mineral Resources are material updates to the previously reported Mineral Resource (Snowden, 2011), based upon an infill drill program (21 RC holes for 3,322 m and nine diamond holes for 1,676.5 m), a geological re-interpretation, and a significant increase in the number of DTR and density results.

The Sandalwood, Clark Hill North, Clark Hill South, and Snark Mineral Resources were all reported in 2009 (Allen, 2009) and in 2010 (Macarthur, 2010). No further exploration activities have occurred since then; however, the supporting geological model for the Clark Hill South Mineral Resource was re-interpreted and re-estimated following the QP's review of the previous Mineral Resource estimate. In addition, the Mineral Resources are now reported within the existing tenure, resulting in a minor tonnage no longer reported.

3D modelling methods and parameters were used in accordance with best industry practices. Datamine mining software was used for establishing the 3D block models and subsequent grade estimates. Geological interpretations of the iron mineralisation were derived from the drillhole logs and assays. Statistical and grade continuity analyses were completed in order to characterise the mineralisation and were subsequently used to develop grade interpolation parameters. Grade was interpolated into the block models using ordinary kriging. Densities were calculated for each block based upon an iron-density algorithm.

The block models were classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014). Only Mineral Resources are estimated – no Mineral Reserves are defined.

14.2 Software

The Mineral Resource estimates were prepared using Datamine Studio, with the geological interpretations carried out using Micromine software. Geostatistical analyses were conducted using "Supervisor" (Snowden Industries) and "GeoAccess Professional" (Widenbar and Associates) packages.

14.3 Moonshine and Moonshine North

14.3.1 Drillhole Database

The drillhole data was provided in two separate databases, as per the following:

- 2019 drilling program, maintained by Macarthur
- Pre-2019 drilling data, previously maintained by CSA Global, and subsequently maintained by Macarthur with all security protocols maintained.

The databases were provided in Microsoft Access format with tables containing, at a minimum, collar, survey, assay, lithological and weathering data. Both databases were separately imported into Datamine and the imported data validated for the following items:

- Overlapping sample data (assays, surveys, specific gravity, lithology logs)
- Missing or absent data
- Negative assay grades
- Excessive drillhole deviation over short intervals.

A few minor issues were noted and reported to Macarthur, who corrected the relevant database table. Assay data presenting as negative values from the pre-2019 drilling database were treated as missing samples, as per advice provided by Macarthur, and the assay grades set to absent. The assays for manganese (head and concentrate assays) in the pre-2019 assay data were provided in elemental state, and the QP re-calculated the assays into their oxide constituents, to match the equivalent assays as provided int the 2019 database assay table.

The following assay re-calculations were preformed:

- MNO = MN * 1.2912
- MNOCON = MNCON * 1.2912

Some assays in the pre-2019 database assay table were provided in ppm format, and were converted to percentage to match the 2019 database table settings, as per the following formula, for both head and concentrate assays:

- CR = CR_PPM / 10000
- V = V_PPM / 10000

All assay fields were set to their appropriate oxidation state during importation of data from the laboratory certificates into the database.

A single drillhole file was created in Datamine after merging the relevant tables from the two databases, capturing collar, survey, assay, geology, DTR and density data. Drillholes were flagged according to drillhole type and year of drilling, to allow relevant statistical assessment of the data to occur.

Drillhole statistics are presented in Table 11. The database was provided to CSA Global on 4 June 2020, with no additional data provided thereafter.

A drillhole collar plot for Moonshine and Moonshine North is presented in Figure 13 in Section 10.1.

14.3.2 Topography

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.

The dxf file was imported into Datamine and saved as a wireframe surface. The surface was validated against several drill collars, representing different geographical locations of the resource, to ensure matching elevation levels between drillhole survey and topographic survey. The topographic DTM covers an area significantly larger than the mineralisation footprint and the area was trimmed to cover the deposit footprint. The topographic survey is considered adequate to support the Mineral Resource estimates.

14.3.3 Geological Interpretation

All geological models, for lithology, weathering and mineralisation, were interpreted and prepared by Macarthur. Discussion is provided in Section 7.

The outcropping geology of the project area is comprised of a combination of unaltered silica-rich BIFs and altered, enriched haematite/goethite BIFs. Weathering has resulted in the leaching of majority of the silica from the BIFs, thus producing a rock with elevated iron and decreased silica grades, 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, closely following the shape of the host BIF unit, 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 to in excess of 250 m below surface as demonstrated by results from several drillholes, confirming a consistent easterly dip of the hangingwall for the majority of the Moonshine and Moonshine North prospects.

A review of a log probability distribution of all DTR results (Figure 40) reveals a minor inflection at approximately 15% DTR, and coupled with geological logging of magnetite mineralisation from drill cuttings, lead to a lower cut-off of 15% DTR to be selected for modelling of the mineralisation domains. The interpreted mineralisation domains are confined to the fresh rock weathering domain, truncated at the base of oxidation, and by demonstrated levels of confidence at depth as determined by depth of drilling. Small pockets of internal waste, including quartz veins, mafic dykes, and shale horizons, which have DTR <15%, are included in the mineralisation domains due to their small thickness, typically 1–3 m, in comparison to the overall width of the mineralisation, making them unsuitable to selectively exclude.

The footwall of the mineralisation at Moonshine and, to a lesser extent, Moonshine North may sometimes be constrained by the thickness of the siliceous footwall (>60% SiO_2), which make up the footwall of the western lodes, with thicknesses up to 80 m, as observed in drill samples and in outcrop. This siliceous footwall is modelled as part of the primary BIF package and is demonstrated by consistent unit thickness and strike extent over 100 m. The siliceous footwall is excluded from the mineralisation domains and Mineral Resource due to the low DTR results, with high amount of silica remaining in the magnetic fractions.

Figure 41 and Figure 42 show representative cross sections through the Moonshine deposit, with BIF and mineralisation domain boundaries indicated.

The sectional interpretation was completed on 200 m ± 100 m oblique sections for the Moonshine deposits, with sectional spacing reduced to 50–100 m in areas where infill drilling occurred during 2019. The mineralised envelopes for Moonshine and Moonshine North were projected down to the 100 mRL, although Mineral Resources were not always reported to these depths of mineralisation.

Wireframe solids were created, linking the sectional polygons along strike. The wireframes were imported into Datamine where they were given unique file names and verified to check for crossing facets and open triangles. A total of eight mineralisation domains define the Moonshine deposit and eight domains define the Moonshine North deposit. The domains vary in strike extent, depth extent and thickness. Magnetite mineralisation supporting the Mineral Resource is confined to below the base of oxidation surface. Mineralisation is recorded in the oxide zone, above the base of oxidation, but is not regarded as part of the magnetite Mineral Resource.

A representative cross section through the Moonshine deposit is presented in Figure 43, showing the host BIF unit and mineralisation domain (where DTR >15%), with drillholes, as modelled in support of the Mineral Resource. Moonshine North exhibits similar geometry of the host geological units to Moonshine, as shown in Figure 43. Table 17 presents the resource model variables and codes associated with the key geological features.

Table 17: List of geological models and Datamine filenames

Feature	Deposit	Wireframe (*tr/pt)	Datamine variable	Code
Weathering	All	Box2_	WEATH	10 (above)
		Box2_		30 (below)
Mineralisation	Moonshine	W1	MINZON	1001
		E1 to E7		2001 to 2007
	Moonshine North	NW1 to NW3		3001 to 3003
		NE1 to NE5		4001 to 4005
Lithology	All	bif	LITH	1

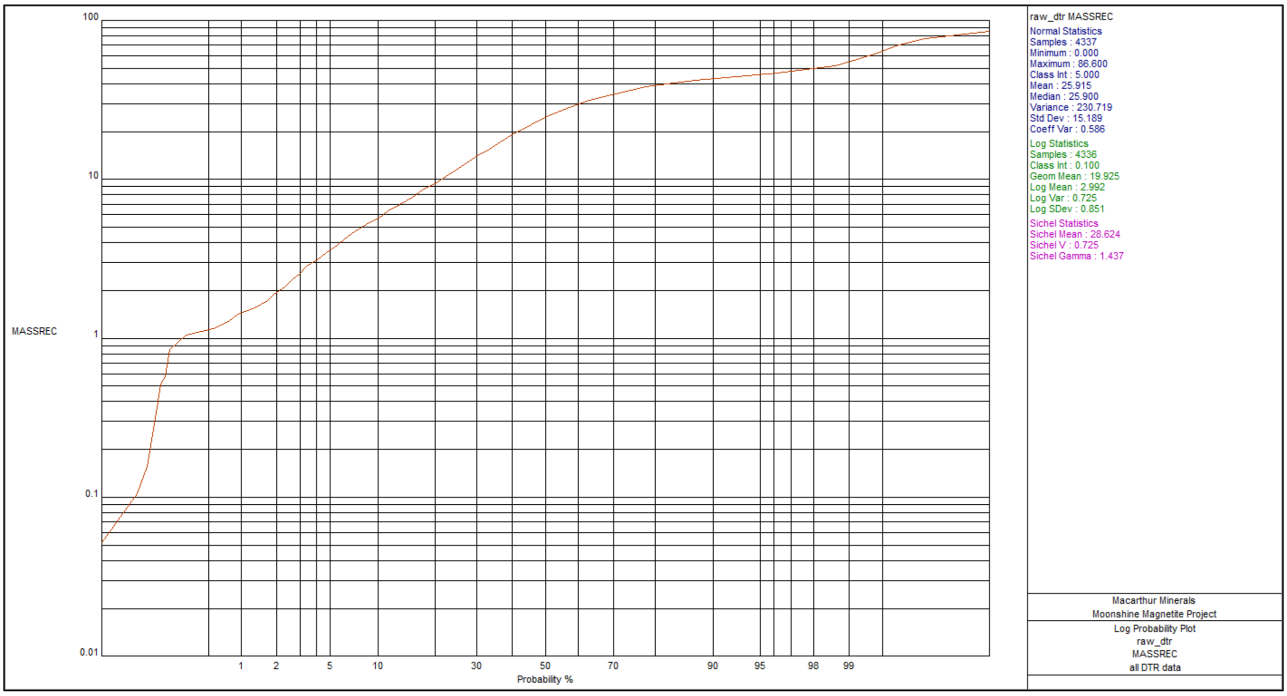

Figure 40: Log probability plot, DTR (%) all sample data

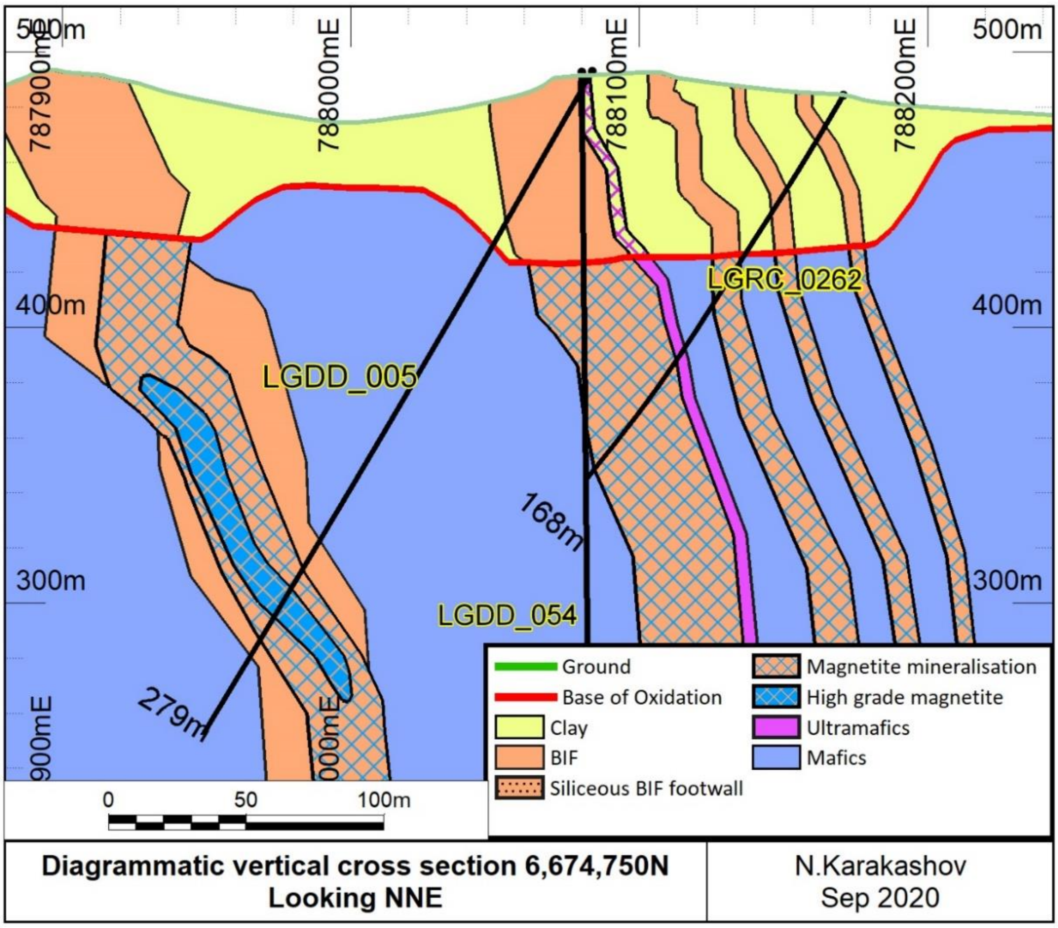

Figure 41: Cross section showing the relationship of the high-grade magnetite pockets and bulk magnetite mineralisation, Moonshine (variability of depth of weathering is demonstrated)

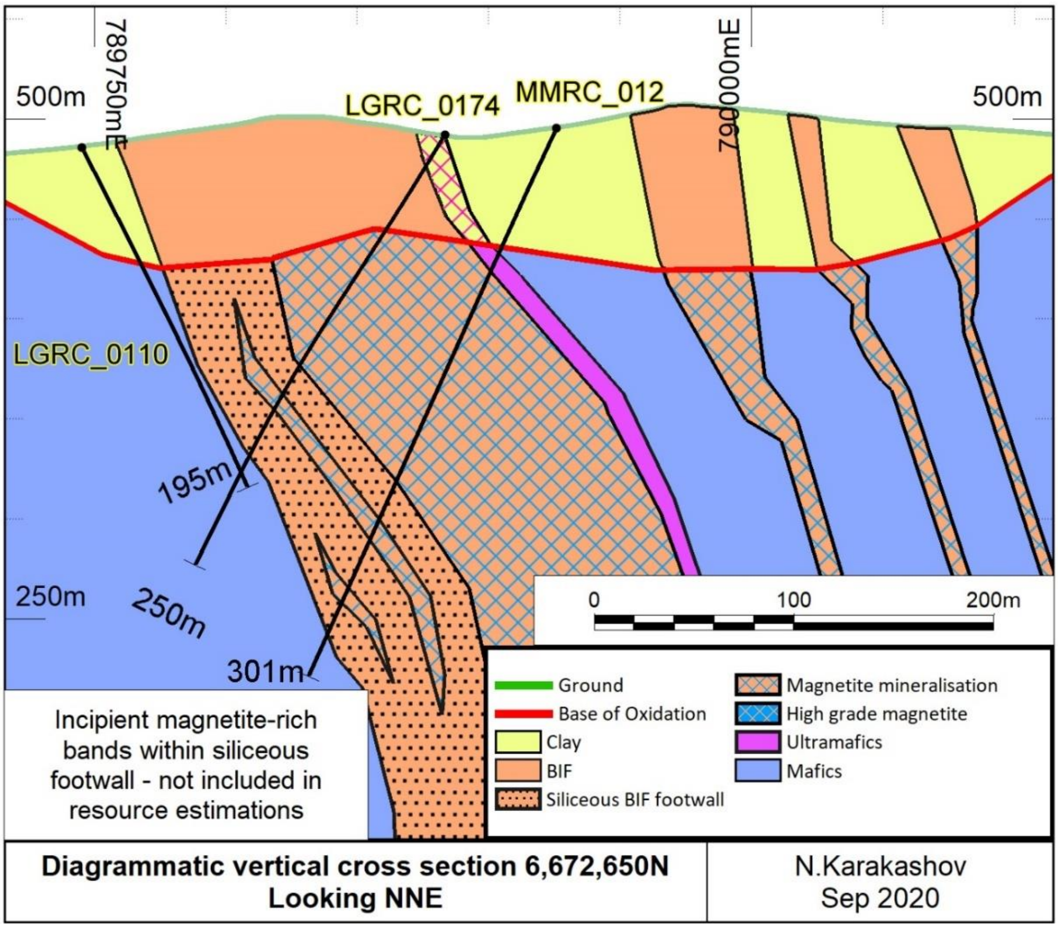

Figure 42: Cross section showing a typical profile through Moonshine, with a pronounced siliceous footwall

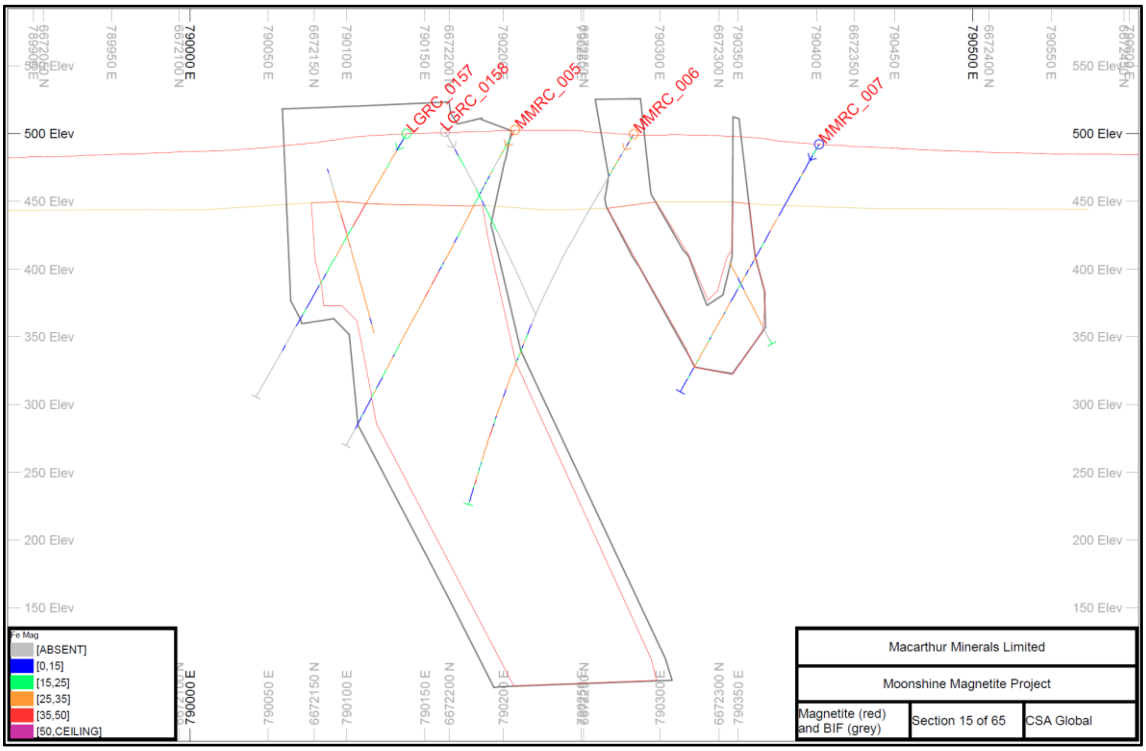

Figure 43: Cross section through Moonshine, showing host BIF (grey) and mineralisation envelope (where DTR>15%, red)

Also shown are "base of oxidation" (yellow surface) and topographic surface (red). Drillholes shown with traces coloured by Fe %. View to north-northwest. Date of figure is July 2020.

14.3.4 Sample Coding by Domain

Drillhole samples within the Datamine drillhole files were flagged with unique codes according to the geological, mineralisation and weathering domain within which they were located.

14.3.5 Sample Compositing

An analysis of sample lengths for the domained sample data indicate a range of sample lengths of between <1 m to 6 m lengths. RC samples were sampled at between 1 m and 6 m intervals over the life of the Project, with a decision made to select a composite length of 5 m.

14.3.6 Statistical Analyses

Summary Statistics

Statistical summaries for key grades are presented in Table 18 to Table 21, for Moonshine and Moonshine North. Histograms for the head and concentrate grades for iron, phosphorous and silica are presented in Figure 44 to Figure 46. A histogram for Mass Recovery (DTR) results is presented in Figure 47. The histograms show the result of separating the magnetite from the whole sample using the Davis Tube method, with iron grades significantly higher in the product, and a corresponding material decrease in silica and phosphorous grades. The higher silica and phosphorous grades are associated with silica and non-magnetic minerals caught in the gangue material, such as the siliceous bands in the host BIF rock.

Table 18: Summary statistics, head grades, Moonshine (values in %)

Statistic	Al_2O_3	CaO	Fe	LOI	MgO	MnO	P	S	SiO_2
Number	2,089	2,089	2,089	2,089	2,089	2,050	2,084	2,089	2,089
Minimum	0	0.03	1.6	-1.054	0.05	0.012	0.007	0.001	28.6
Maximum	14.93	22.10	42.20	17.00	31.24	2.20	0.276	12.30	88.53
Mean	1.19	2.38	27.29	1.51	2.83	0.20	0.046	0.80	52.07
Standard deviation	2.12	1.74	7.54	2.21	3.56	0.19	0.017	1.41	8.38
Variance	4.49	3.03	56.90	4.88	12.64	0.03	0.000	2.00	70.27
Coefficient of variation	1.79	0.73	0.28	1.47	1.26	0.94	0.361	1.77	0.16

Table 19: Summary statistics, concentrate grades, Moonshine (values in %)

Statistic	Al_2O_3	CaO	Fe	LOI	MgO	MnO	P	S	SiO_2	DTR
Number	1,766	1,765	1,766	1,735	1,765	1,727	1,765	1,765	1,766	1,870
Minimum	0.001	0.001	48.3	0	0.001	0.001	0.003	0.001	1.448	0.001
Maximum	1.50	1.98	70.98	6.60	2.42	0.39	0.08	19.20	33.10	78.24
Mean	0.10	0.20	66.34	0.11	0.27	0.05	0.02	1.17	6.66	29.74
Standard deviation	0.16	0.15	3.15	0.59	0.15	0.04	0.01	2.44	3.85	13.18
Variance	0.03	0.02	9.91	0.35	0.02	0.00	0.00	5.95	14.80	173.68
Coefficient of variation	1.55	0.74	0.05	5.52	0.58	0.74	0.65	2.09	0.58	0.44

Table 20: Summary statistics, head grades, Moonshine North (values in %)

Statistic	Al_2O_3	CaO	Fe	LOI	MgO	MnO	P	S	SiO_2
Number	659	659	659	650	659	659	659	659	650
Minimum	0.00	0.02	3.89	-1.07	0.06	0.02	0.007	0.00	2.80
Maximum	19.45	22.14	61.80	16.20	20.20	1.01	0.298	11.06	79.57
Mean	1.35	2.63	30.56	2.21	2.57	0.20	0.054	0.84	46.33
Standard deviation	2.46	2.61	8.41	2.80	1.75	0.17	0.020	1.55	12.55
Variance	6.06	6.82	70.79	7.84	3.05	0.03	0.000	2.41	157.49
Coefficient of variation	1.82	0.99	0.28	1.27	0.68	0.87	0.374	1.86	0.27

Table 21: Summary statistics, concentrate grades, Moonshine North (values in %)

Statistic	Al_2O_3	CaO	Fe	LOI	MgO	MnO	P	S	SiO_2	DTR
Number	455	455	455	438	455	455	455	455	455	462
Minimum	0.00	0.00	29.50	0.00	0.03	0.00	0.002	0.00	0.87	0.00
Maximum	3.90	7.07	71.44	2.91	4.00	0.35	0.773	10.40	51.50	82.04
Mean	0.18	0.35	64.56	0.10	0.43	0.05	0.056	0.71	8.45	30.21
Standard deviation	0.38	0.54	6.06	0.39	0.41	0.06	0.112	1.34	7.05	11.75
Variance	0.14	0.29	36.72	0.15	0.16	0.00	0.013	1.79	49.69	137.99
Coefficient of variation	2.11	1.55	0.09	4.07	0.95	1.06	2.007	1.89	0.83	0.39

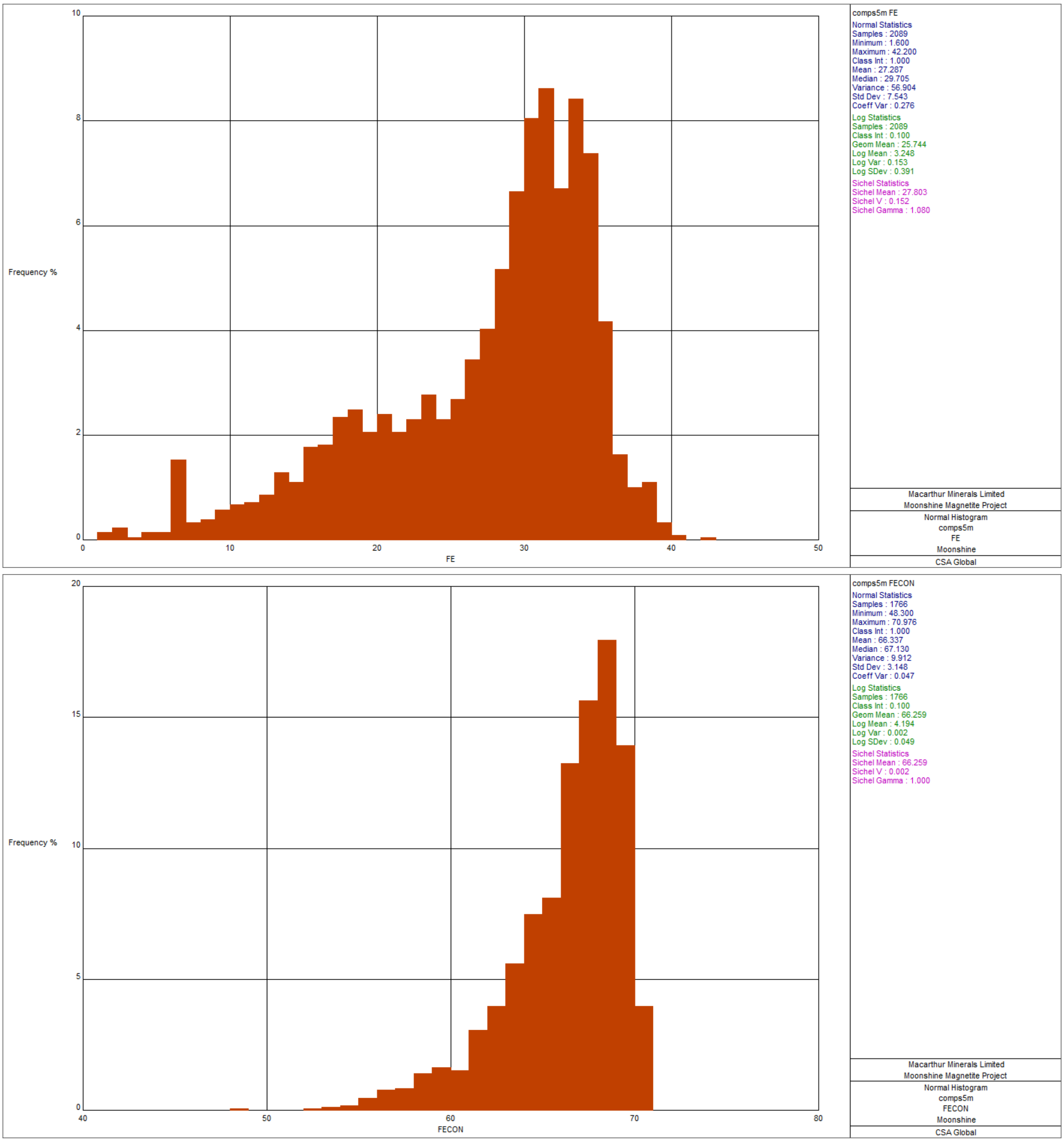

Figure 44: Histograms of Fe (Head) and Fe (Concentrate), from composited samples within mineralisation domains in Moonshine (values in %)

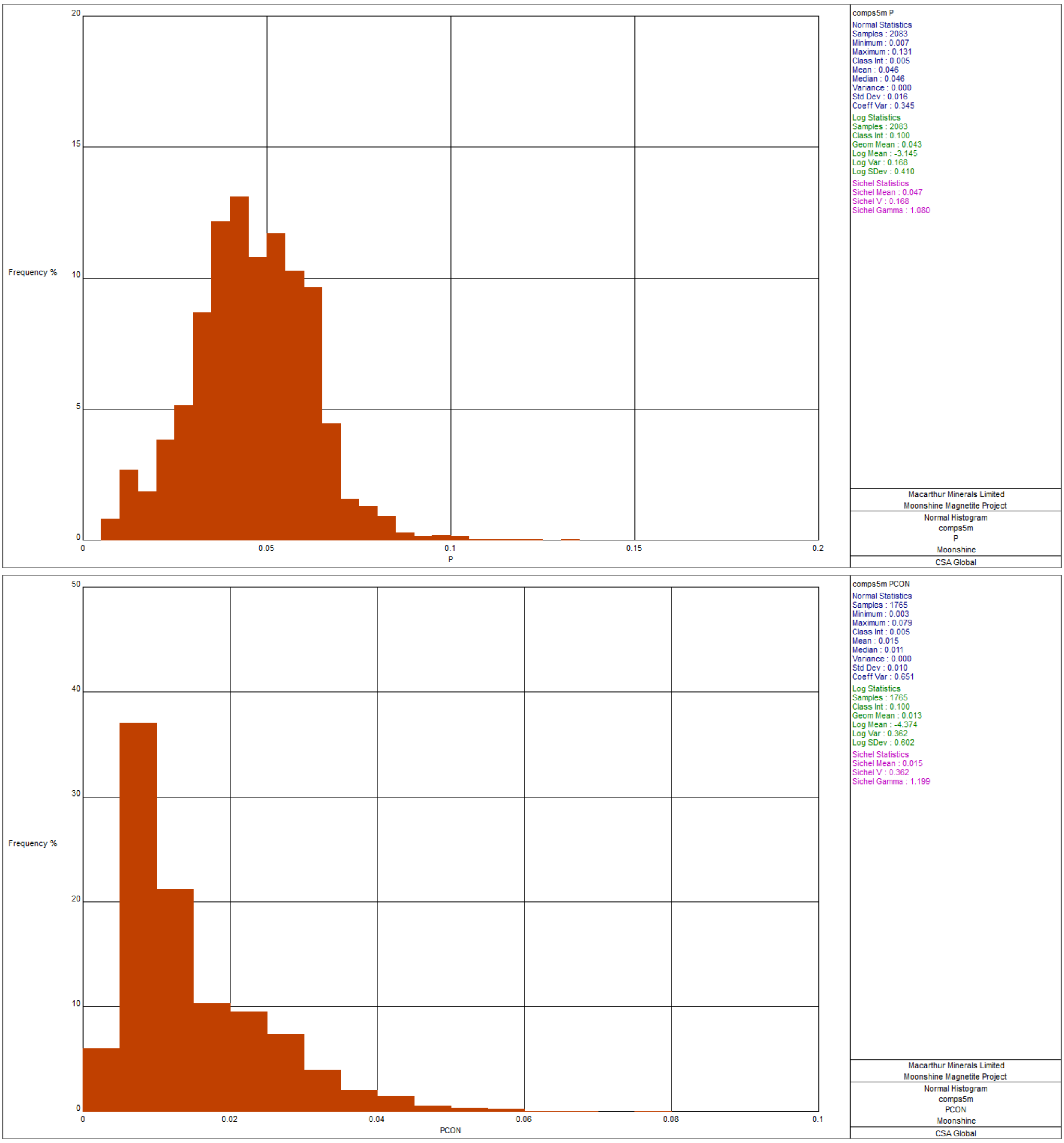

Figure 45: Histograms of P (Head) and P (Concentrate), from composited samples within mineralisation domains in Moonshine (values in %)

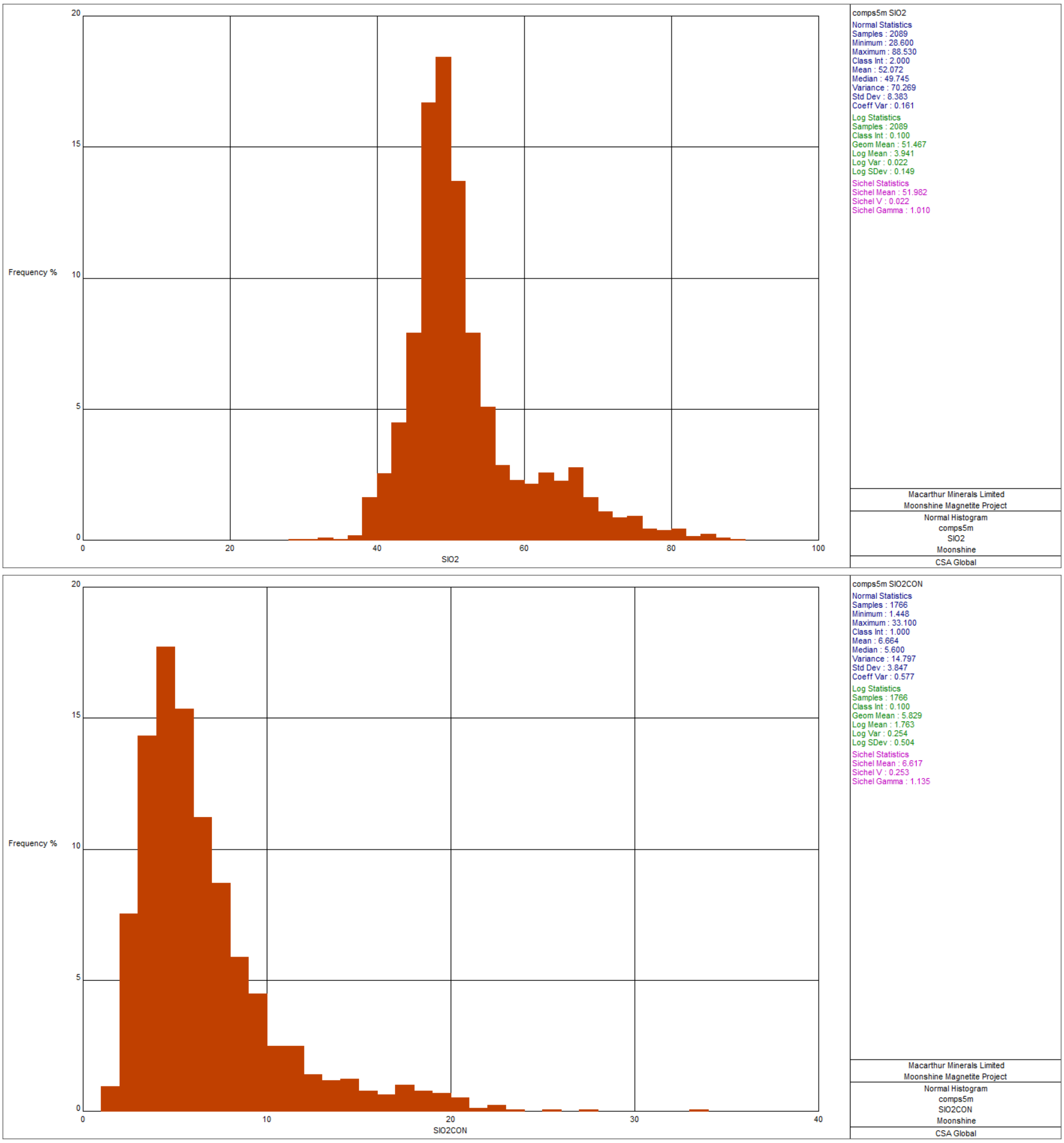

Figure 46: Histograms of SiO_2 (Head) and SiO_2 (Concentrate), from composited samples within mineralisation domains in Moonshine (values in %)

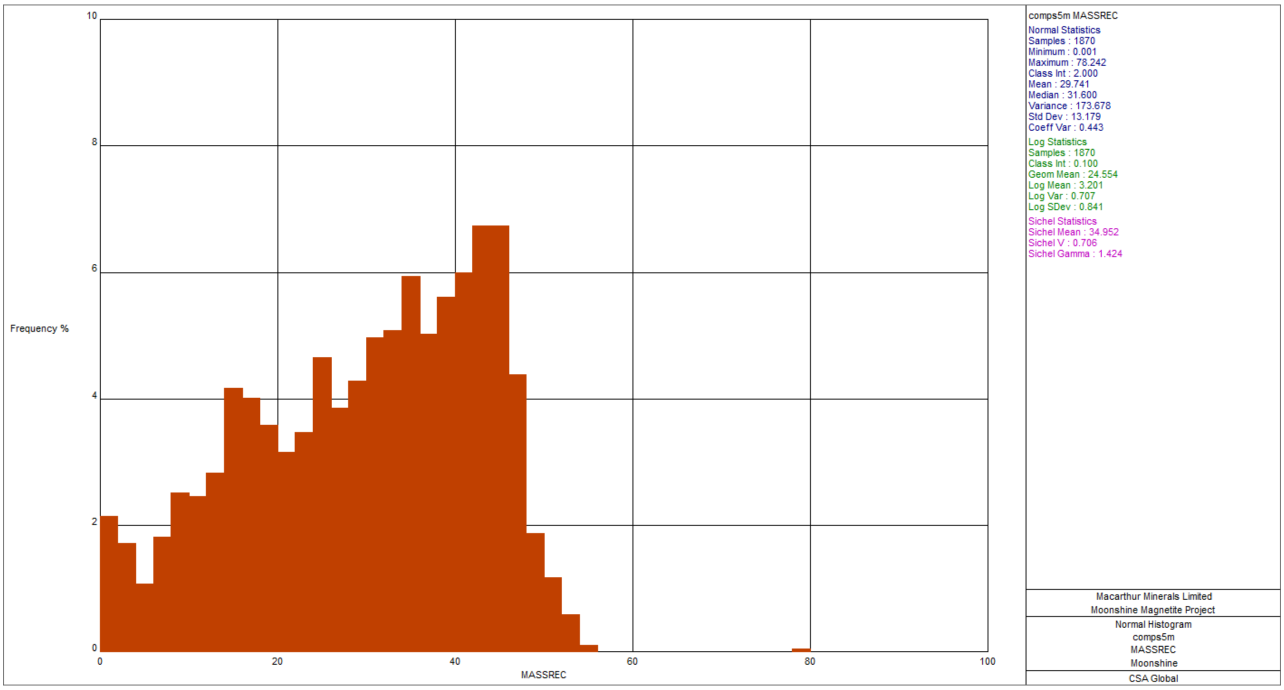

Figure 47: Histogram of mass recovery (DTR), from composited samples within mineralisation domains in Moonshine (values in %)

14.3.7 Mass Balance

An analysis of mass data is required to ensure the assayed grade values sum 100%, within a tight tolerance. This has been achieved with a few outliers noted. An example is provided in Figure 48, which shows a histogram of the mass balance data for the most populated domain in Moonshine. Most data are between 98% and 102%, with a mean value of 99.5%.

The QP is satisfied that the assay data is of suitable quality, with regards to Mass Balance, to be included in the Mineral Resource estimate.

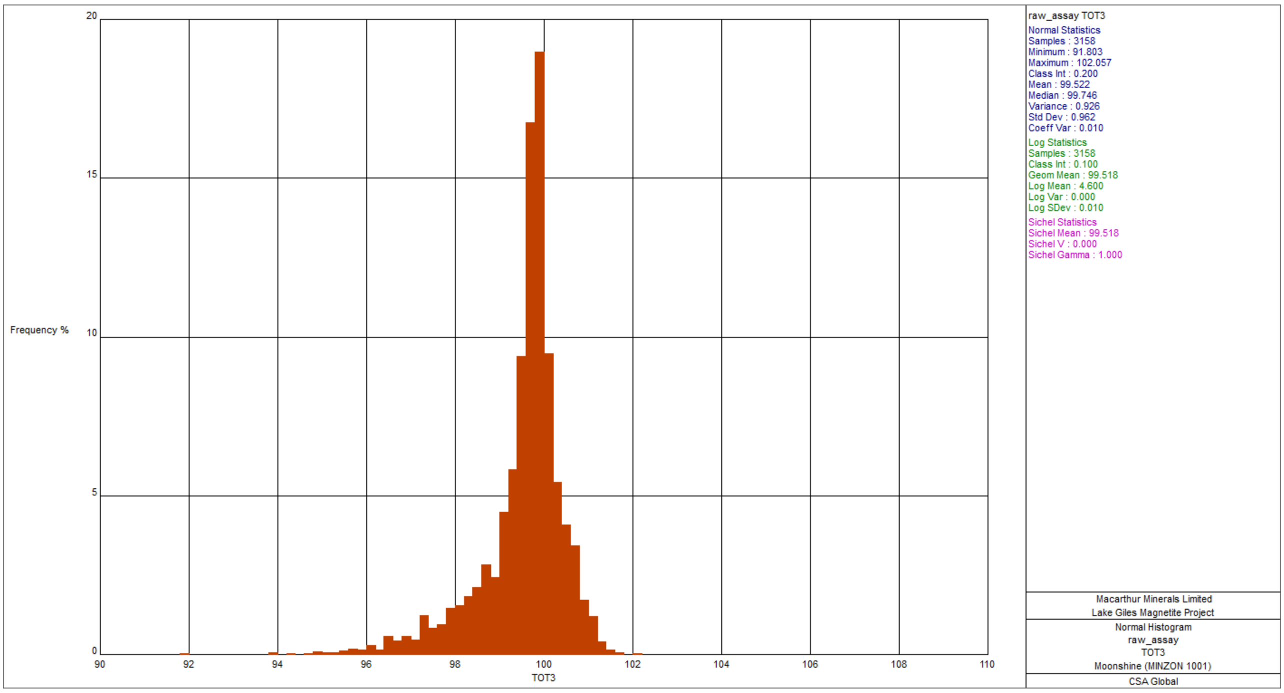

Figure 48: Mass balance for main Moonshine domain

14.3.8 Top Cutting of Grades

A review of grade outliers was undertaken to ensure that extreme grades are treated appropriately during grade interpolation. Although extreme grade outliers within the assayed data are real, they are potentially not representative of the volume they inform during estimation. If these values are not cut, they have the potential to result in significant grade over-estimation on a local basis.

Top cuts were determined for selected composited head and concentrate assay grades using the following method:

- A statistical review was undertaken of the grades on a domain-by-domain basis, using the MINZON domain variable
- Log probability and log histograms of the population statistics by domain were reviewed
- Where population breaks at the highest percentile bins are noted, a top cut was selected, and top cut statistics were tabulated
- The samples with grades > top cut grades were reviewed in Datamine to determine if they were clustered with other data or located in isolation.

In all cases, the top cut value was equivalent to greater than the 99.5th percentile of data. No bottom cutting of grades was used.

14.3.9 Variography

A variogram is a graph of the variability between pairs of samples against the distance between them in a specific direction. A model is calculated for a particular variogram, which provides parameters known as the nugget, sills and ranges.

The nugget effect is the variability between the closest spaced samples available, which is usually two adjacent samples from the same drillhole. The nugget value is where the variogram model cuts the Y-axis of the variogram and is usually referred to as a percentage of the total sill. The type of variogram that produces such a variogram is termed a downhole variogram.

As another explanation, the nugget effect is the theoretical variance in grade that would be obtained if a duplicate sample was taken at exactly the same point in space. The nugget effect is an important measure of the reliability/variability of the assay value of samples and is one of the parameters used to determine the weight assigned to individual samples when estimating block grades. A sample population with a low nugget means that more reliability can be placed on nearby individual samples to estimate the grade of a block, such as may be achieved with an “inverse distance weighted” estimate with a high power. Conversely, a grade estimation from a sample population with a very high nugget might require the average grade from a large number of samples be applied as the grade for each block.

The sill is the population variance within a domain and is often normalised to 1.0. The range is the distance at which samples are no longer spatially correlated and can be considered as the point where the variogram model approaches or cuts the sill. This is a subjective decision for which the resource estimator or geostatistician will call on their experience from other projects for the same commodity. More than one sill is often modelled; the first sill (and short range) defines a range of influence up to which the variance between samples may rise very rapidly with increasing distance. Beyond this short range the variability may increase less rapidly with distance until the sill is reached. The short range is often a useful measurement for planning grade control drilling patterns during mining.

Variograms were modelled for selected head and concentrate top cut and composited sample assays located within the most populated mineralisation domain in Moonshine (MINZON 1001). All variograms were modelled capturing a shallow to moderate plunge to the south east, in the plane of mineralisation. Results are presented in Table 22. Selected variogram models are presented in Figure 49 to Figure 53.

Table 22: Variogram sills and ranges

Grade variable	Axes	Direction	Nugget	Sill 1	Range 1 (m)	Sill 2	Range 2 (m)	Sill 3	Range 3 (m)
Fe (Head)	1	-29→134	0.04	0.6	83	0.36	266	-	-
	2	-59→337			19		48		-
	3	10→050			38		47		-
SiO_2 (Head)	1	-29→134	0.13	0.48	110	0.39	380	-	-
	2	-59→337			9		26		-
	3	10→050			15		38		-
Al_2O_3 (Head)	1	-20→136	0.15	0.47	78	0.23	184	0.15	435
	2	-68→346			26		64		80
	3	10→050			35		56		62
MgO (Head)	1	-10→138	0.13	0.32	99	0.45	259	0.1	446
	2	-76→005			6		9		17
	3	10→050			41		47		61
P (Head)	1	-29→134	0.14	0.58	99	0.28	570	-	-
	2	-59→337			83		165		-
	3	10→050			25		37		-
S (Head)	1	-10→138	0.11	0.59	92	0.3	359	-	-
	2	-76→005			23		72		-
	3	10→050			37		60		-
LOI (Head)	1	-29→134	0.12	0.6	66	0.28	200	-	-
	2	-59→337			40		73		-
	3	10→050			26		71		-
Fe (Concentrate)	1	-20→136	0.12	0.5	66	0.38	215	-	-
	2	-68→346			11		21		-
	3	10→050			20		65		-
SiO_2 (Concentrate)	1	-29→134	0.13	0.6	91	0.27	316	-	-
	2	-59→337			25		62		-
	3	10→050			40		59		-
Al_2O_3 (Concentrate)	1	-20→136	0.23	0.47	67	0.3	213	-	-
	2	-68→346			30		100		-
	3	10→050			39		48		-
MgO (Concentrate)	1	-20→136	0.16	0.51	85	0.32	219	-	-
	2	-68→346			33		136		-
	3	10→050			46		133		-
P (Concentrate)	1	-59→123	0.08	0.6	53	0.32	211	-	-
	2	-29→326			58		203		-
	3	10→050			47		66		-
S (Concentrate)	1	-59→123	0.08	0.59	44	0.33	138	-	-
	2	-29→326			86		227		-
	3	10→050			42		92		-
LOI (Concentrate)	1	-76→095	0.13	0.2	57	0.66	234	-	-
	2	-10→322			23		45		-
	3	10→050			70		106		-
Mass recovery	1	-39→132	0.1	0.45	28	0.45	190	-	-
	2	-49→332			25		85		-
	3	10→050			24		46		-

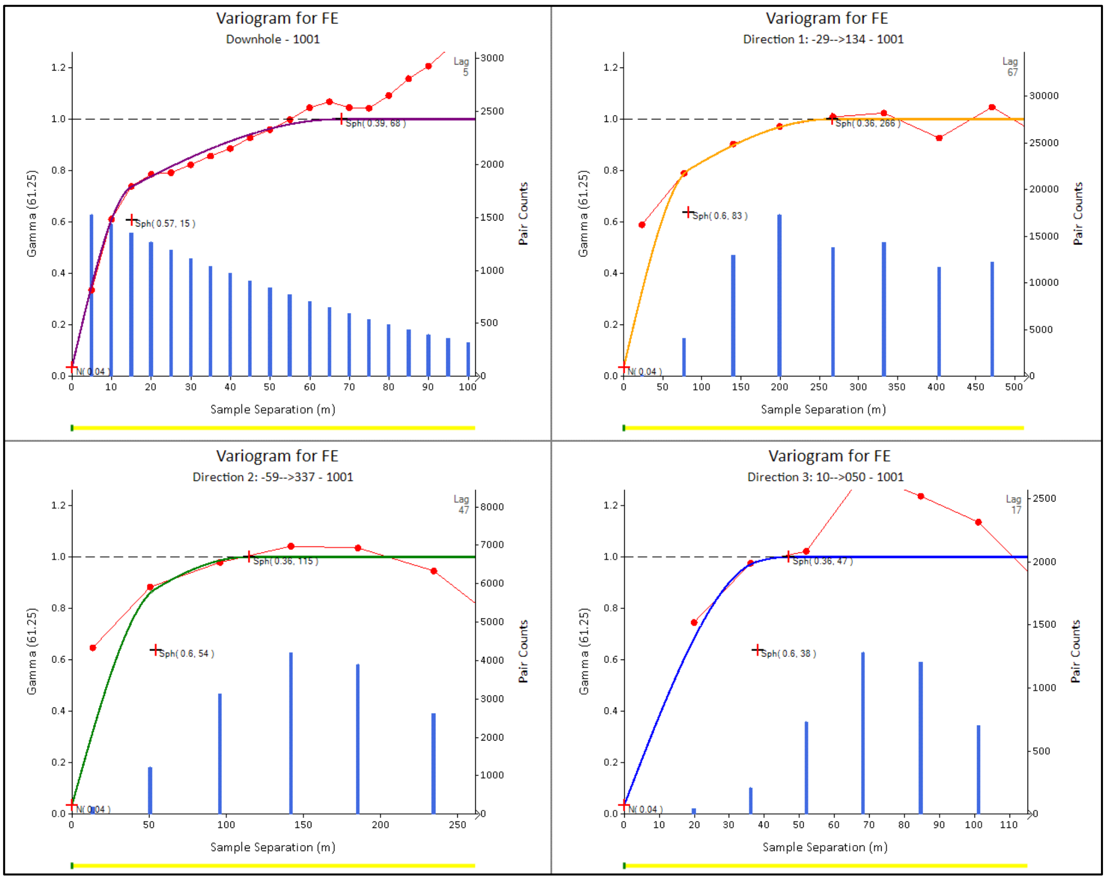

Figure 49: Variogram models for Fe (Head), domain MINZON 1001 (Moonshine)

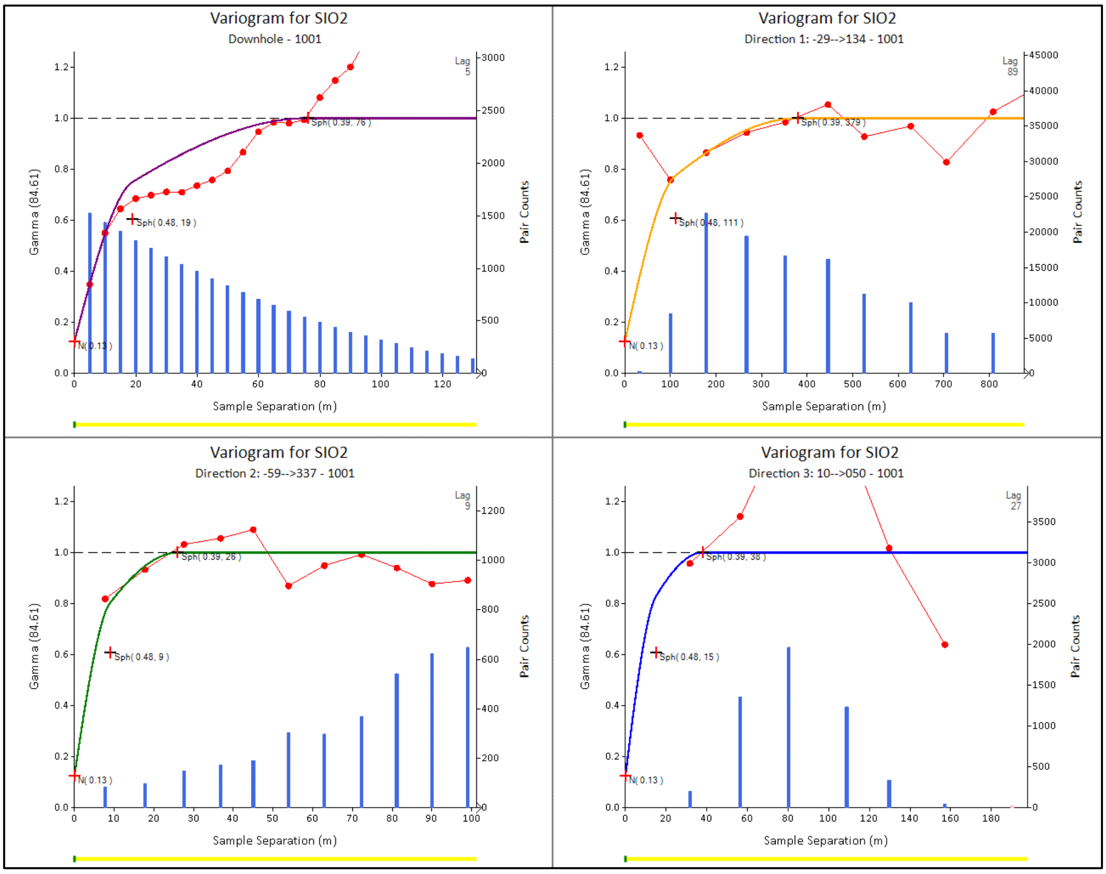

Figure 50: Variogram models for SiO_2 (Head), domain MINZON 1001 (Moonshine)

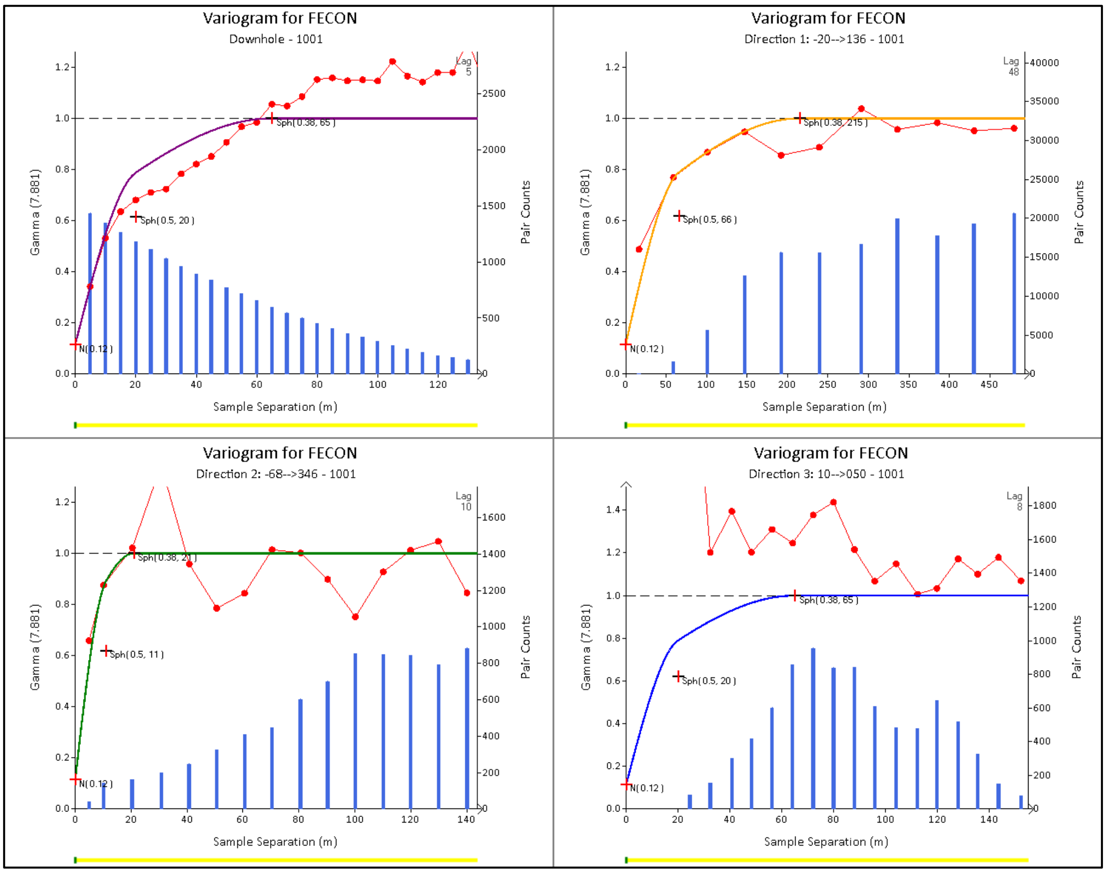

Figure 51: Variogram models for Fe (Concentrate), domain MINZON 1001 (Moonshine)

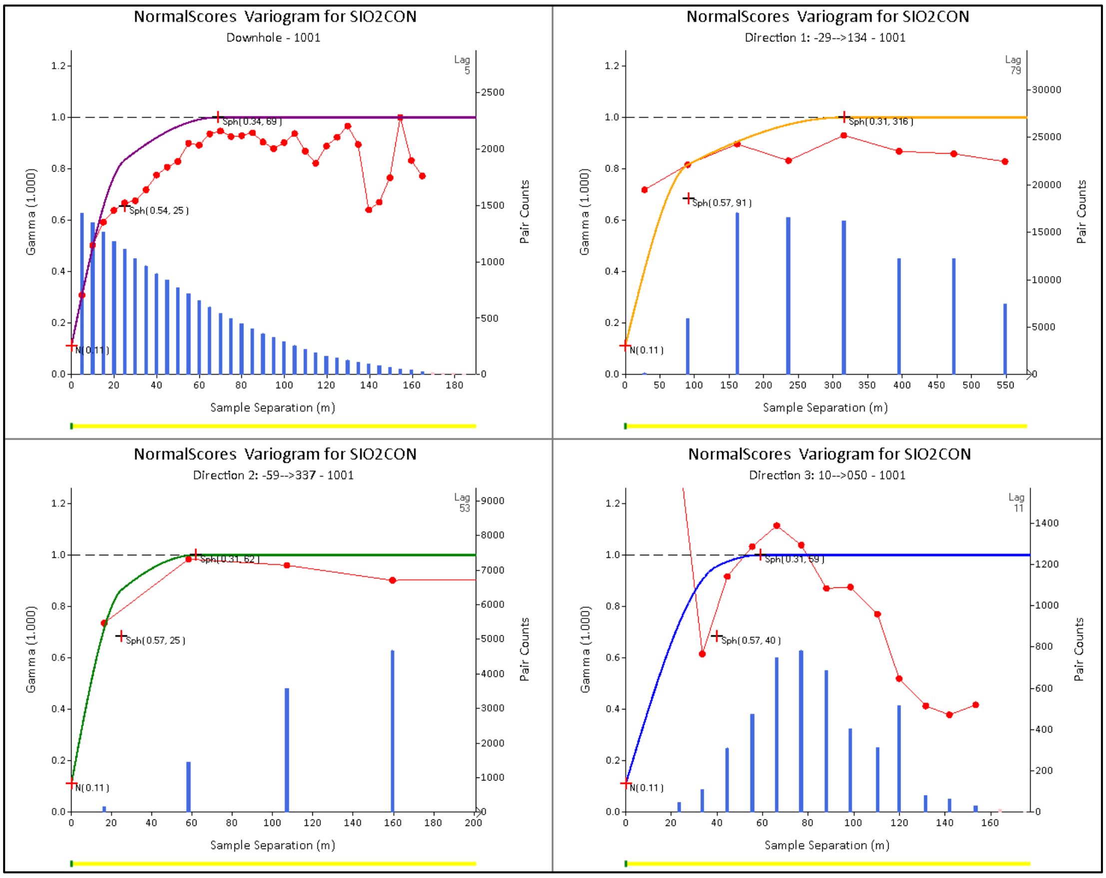

Figure 52: Variogram models for SiO_2 (Concentrate), domain MINZON 1001 (Moonshine)

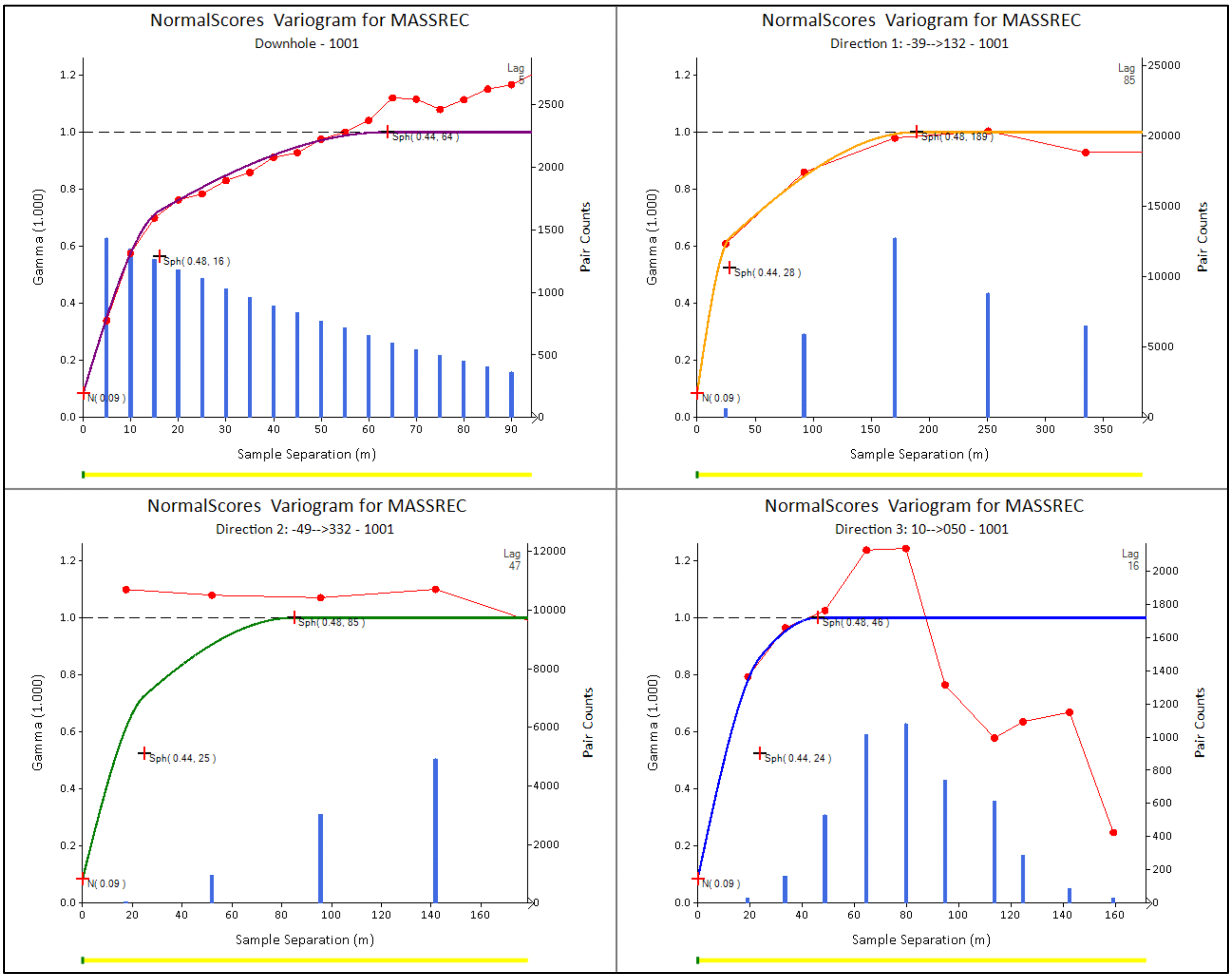

Figure 53: Variogram models for mass recovery, domain MINZON 1001 (Moonshine)

14.3.10 Density

A total of 624 diamond drill samples with bulk density measurements were captured within the mineralisation domains, and a further 400 samples taken from the BIF oxide zones, or from the footwall and hangingwall waste zones. Three mineralisation domains were sampled for Bulk Density data. Figure 54 shows a long section of two of the domains, from Moonshine and Moonshine North, with drillhole intervals containing bulk density data. The location of samples used to measure density was later used to guide the Mineral Resource classification (refer Section 14.3.14).

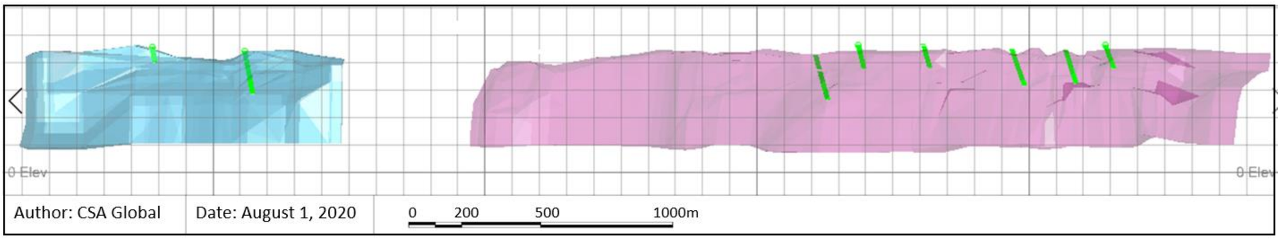

Figure 54: Longitudinal section, Moonshine North (blue) and Moonshine (pink) mineralisation domains with drillhole intervals containing bulk density samples (green); grid is 100 m x 100 m; view to east

Core samples were sealed prior to immersion in water. A conventional Archimedes wet and dry method was used to measure density, as discussed in Section 10.5.

The drill samples with bulk density data were flagged against the mineralisation and weathering domains, and the bulk density results statistically assessed to determine the mean and ranges, and to see if any excessively low or high bulk density values were present.

Algorithms were developed to calculate the density to apply to the Moonshine and Moonshine North block models based upon correlations between the head iron grade from assays, and the corresponding bulk density value of the sample. A correlation plot for the main mineralised domain at Moonshine is presented in Figure 55.

The density algorithms as applied to the Mineral Resources, are given here, where FE is the estimated block grade for Fe (%). The density algorithm for Moonshine was applied to the other Moonshine domains lacking Bulk Density data, and the Moonshine North algorithm was applied to the other Moonshine North domains.

- Moonshine: DENSITY = (0.0241*FE) + 2.624
- Moonshine North: DENSITY = (0.0295*FE) + 2.468
- Moonshine (East): DENSITY = (0.0293*FE) + 2.492
- Unmineralised BIF (oxide): DENSITY = (0.0152*FE) + 2.574
- Unmineralised BIF (fresh): DENSITY = (0.0278*FE) + 2.608
- Country rock (basalts, ultramafics): DENSITY = (0.0187*FE) + 2.683.

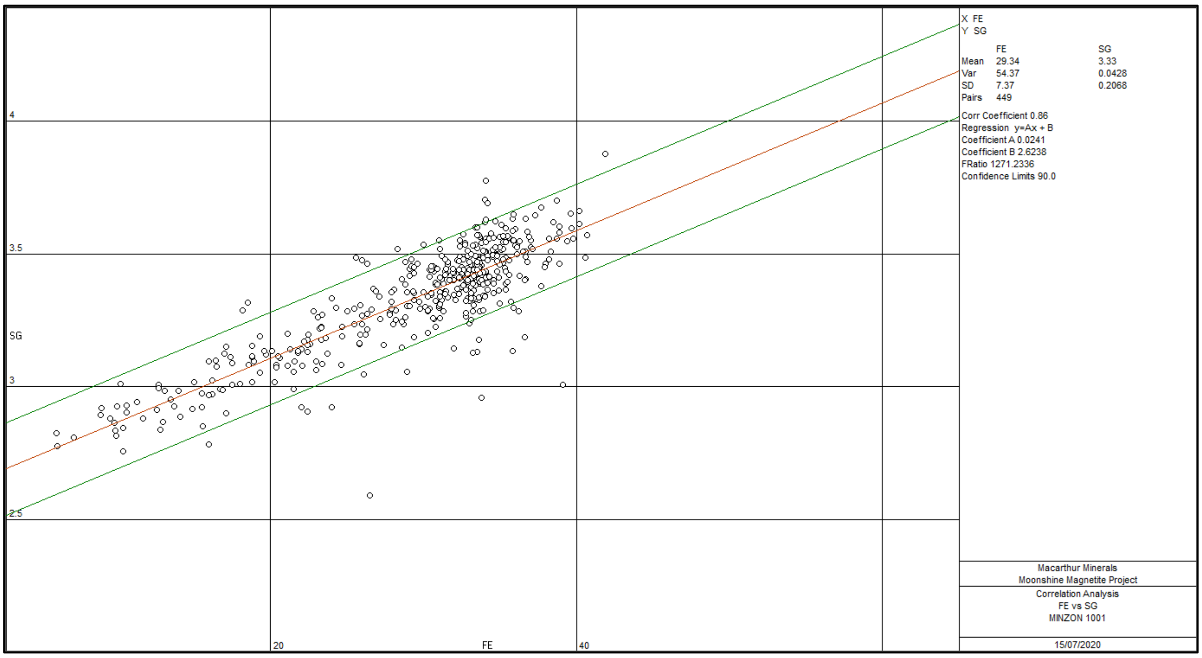

Figure 55: Correlation plot, Fe (Head) vs specific gravity (bulk density), mineralisation domain MINZON 1001 (Moonshine)

14.3.11 Block Model

A block model was created to encompass the full extent of the Moonshine and Moonshine North deposits. Block model parameters are shown in Table 23 and block model attributes are shown in Table 17.

The block model used a parent cell size of 25 m(E) x 25 m(N) x 10 m(RL) with sub-celling to 2.5 m(E) x 2.5 (m)N x 2 m(RL) to maintain the resolution of the mineralised lenses. The northing parent cell size was selected based on approximately half of the average drill section spacing in better drilled areas of the deposit. The model cell dimensions in other directions were selected to provide sufficient resolution to the block model in the across-strike and down-dip directions.

The volume block models were validated on screen to ensure blocks were coded correctly according to the input wireframes.

Table 23: Block model dimensions and parameters

Block model parameters model: ms0720md			
	X	Y	Z
Origin	786,500	6,670,900	50
Extent	5,000	6,200	450
Block size (sub-block)	25 m (2.5 m)	25 m (2.5 m)	10 m (2.5 m)
Rotation	None		
Attributes:			
MINZON	Mineralisation Domain		
WEATH	Weathering Domain. 10 = Oxide, 30 = Fresh		
LITH	Lithological domain BIF = 1		
TOPO	Air = 0, In-situ = 50		
DEPOSIT	Moonshine (west) = 1, Moonshine (east) =2, Moonshine NW = 3, Moonshine NE = 4		
Head grades	Estimated grades (ordinary kriging): Fe, Al_2O_3, CaO, Cr, K_2O, LOI, MgO, MnO, P, S, SiO_2, TiO_2, V		
Concentrate grades	Estimated grade (ordinary kriging): FECON, AL2O3CON, CAOCON, CRCON, K2OCON, LOICON, MGOCON, MNOCON, PCON, SCON, SiO2CON, TiO2CON, VCON		
MASSREC	Estimated mass recovery (DTR) grade (ordinary kriging)		
RESCAT	1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Unclassified		
DENSITY	Calculated or assigned bulk density		

14.3.12 Grade Interpolation

Kriging neighbourhood analysis (KNA) was used to guide the selection of sample search ellipse radii, and the number of samples to be used for each block estimate. The variogram models from the main Moonshine mineralisation domain (Section 14.3.9) were used in the KNA process.

Prior to grade interpolation, the mineralisation domain blocks were interpolated with the local wireframe dip and dip directions using Datamine’s dynamic anisotropy. The interpolated values were used to control the orientation of the sample search ellipsoids for grade interpolation.

All head and concentrate grades from top cut and composited data, as detailed in Table 23, were interpolated into the parent cells by ordinary kriging. Blocks were estimated using a search ellipse of 240 m (major) x 120 m (semi-major) x 40 m (minor) dimensions, with a minimum of eight and a maximum of 18 samples from a maximum of four samples per drillholes. Search radii were increased, and the minimum number of samples reduced in subsequent sample searches if cells were not interpolated in the first two passes. Cell discretisation of 5 x 5 x 2 (X, Y, Z) was employed.

Hard boundary estimation was used when estimating within the mineralisation domains, such that samples from one mineralisation domain could not be used to interpolate blocks in an adjacent domain.

14.3.13 Block Model Validation

Model validation was carried out graphically and statistically to ensure that block model grades accurately represent the drillhole data. Drillhole cross-sections were examined to ensure that model grades honour the local composited drillhole grades. Representative cross sections through the Moonshine deposit (Figure 56) and Moonshine North (Figure 57) show the block and drill sample grades coloured by iron. In both examples, mineralisation is shown in the drillhole traces within the oxide weathering zone, above the block model blocks as shown, but these are not considered to be part of the Mineral Resource.

A number of statistical methods were employed to validate the block model, including:

- Comparison of block grade with nearest composites.
- Comparison of kriged model and composite populations.

Results showed that the grade interpolation had performed as intended, with block grades reasonably reflecting the input sample grades. Validation methods and their results should be reviewed as a package and opinions should not be formed on the performance of the model on one set of data.

Swath plots for MINZON 1001 (Moonshine deposit) are presented in Figure 58 to Figure 61 from blocks and composited sample grades contained within the domain. Swath plots compare the trend of average grades of the model and input sample data, along a specified direction, from a specified domain. This demonstrates some smoothing of interpolated block grades compared to input sample data, but the sample data trends can be observed in the block grade distribution.

Mean Fe (%) grades from blocks and composited samples (clustered and de-clustered) were compared. The domains are selected where they contain blocks with a first search volume recorded, and only those blocks were used to calculate the mean block grade per domain. Results show a similarity in mean grade for the largest tonnage domains. Some domains show a significant difference between the model and sample mean grades. These domains usually have few samples, and the higher-grade samples are interpreted to have had a disproportional impact upon the volume of the domain, with a large volume of high-grade blocks supported by few samples.

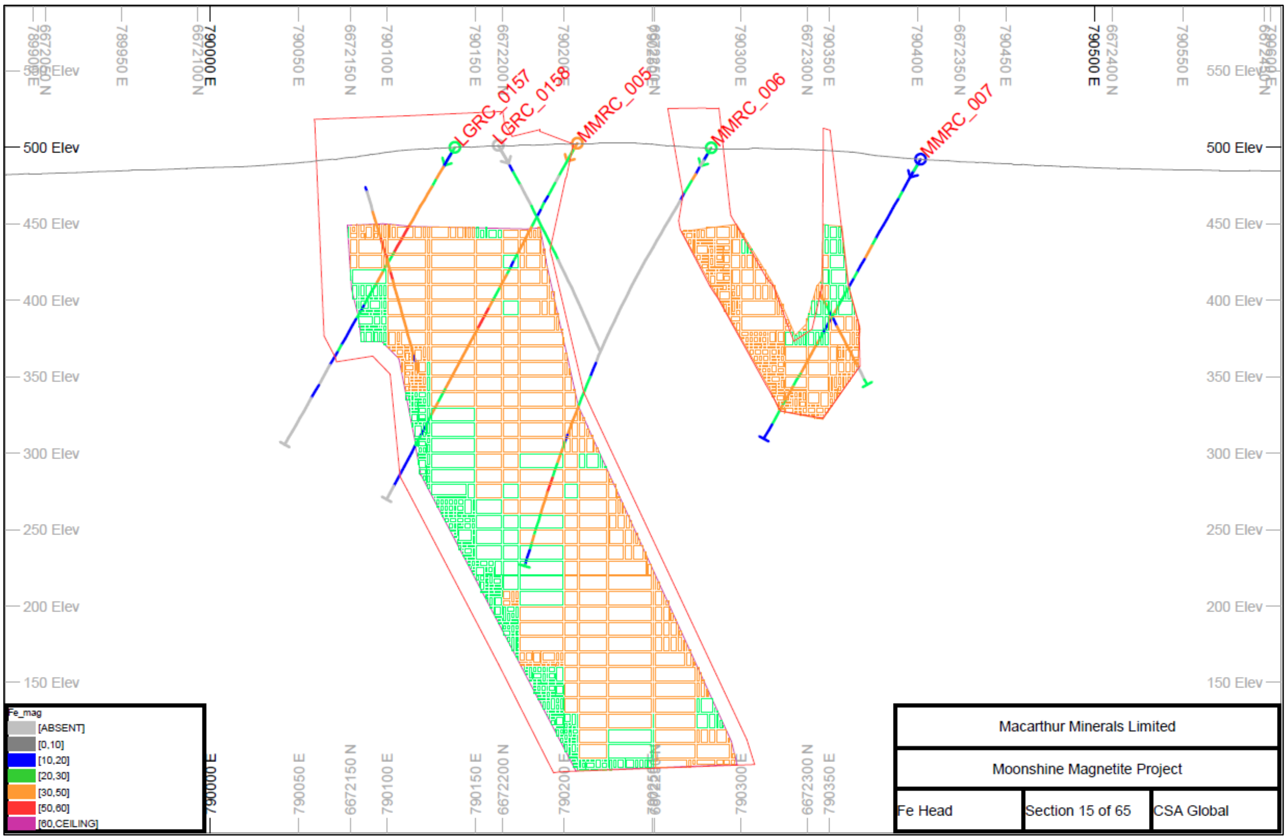

Figure 56: Representative cross section through Moonshine showing block model blocks and drillholes coloured by Fe %, with mineralisation domain, BIF domain, and topographic DTM wireframes shown

Note: Oxide domain blocks not shown. Date of image is July 2020.

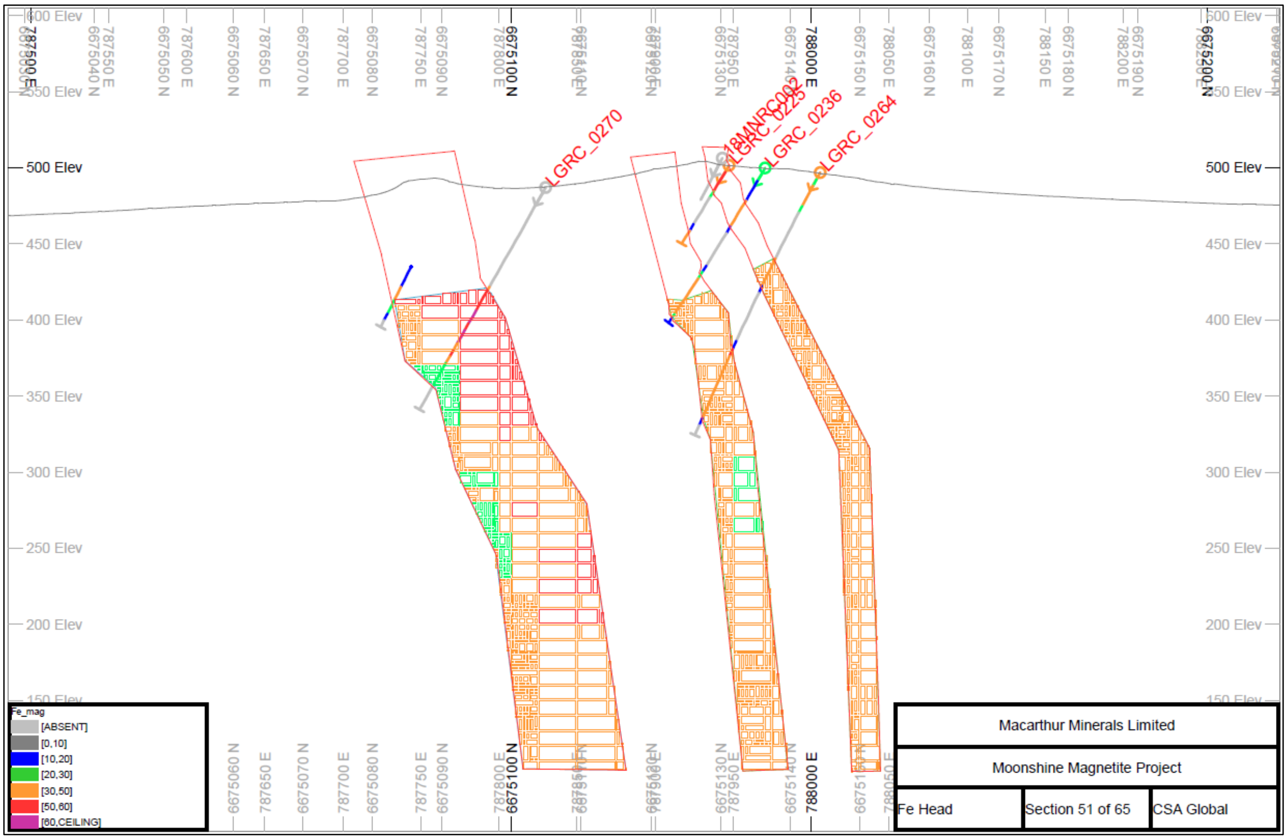

Figure 57: Representative cross section through Moonshine North showing block model blocks and drillholes coloured by Fe %, with mineralisation domain, BIF domain, and topographic DTM wireframes shown
Note: Oxide domain blocks not shown. Date of image is July 2020.

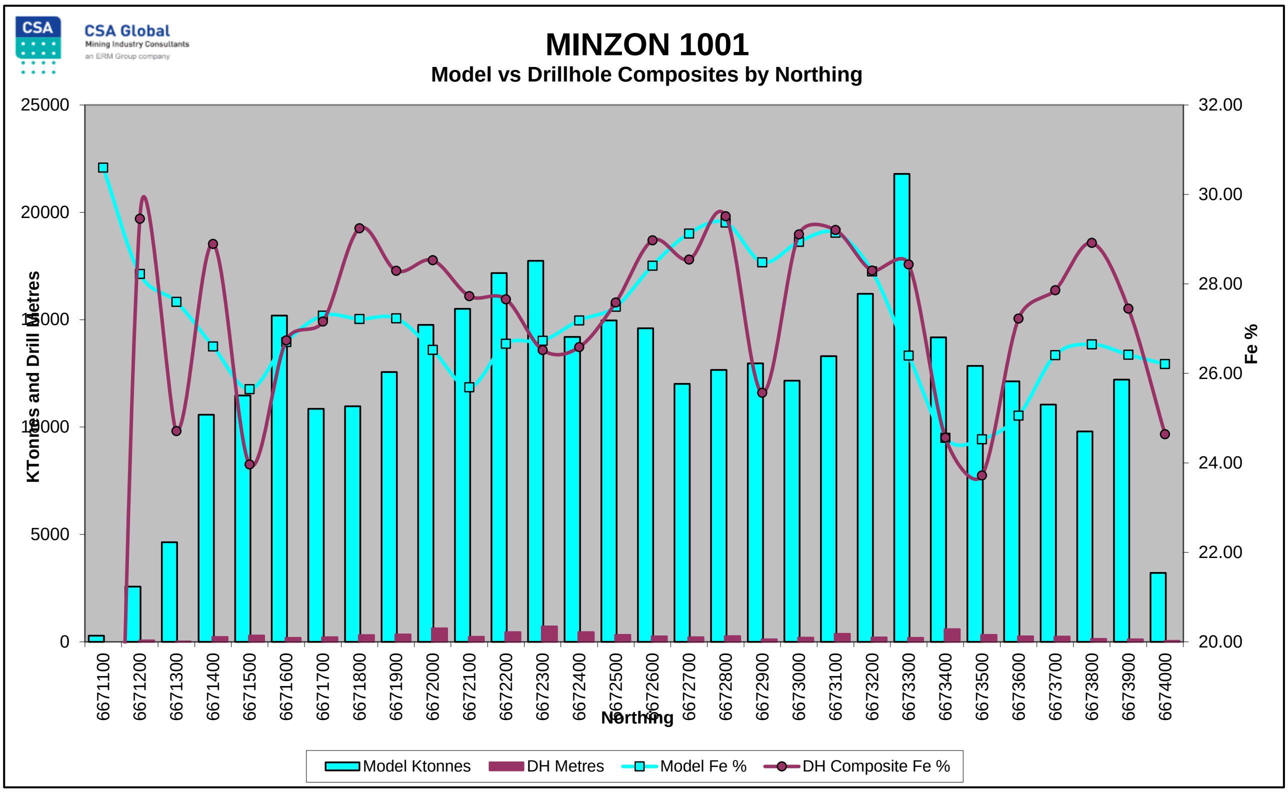

Figure 58: Swath plot, Fe (Head) by northing, MINZON 1001, Moonshine

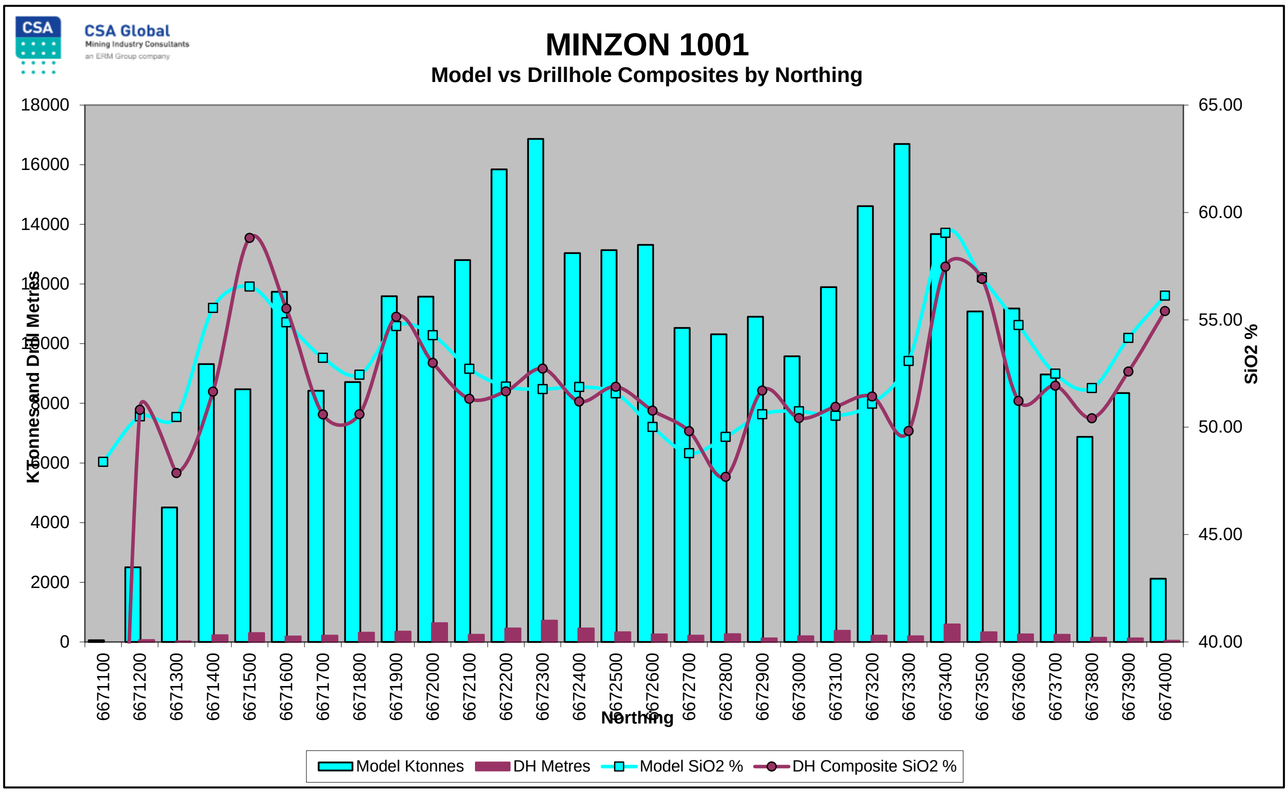

Figure 59: *Swath plot, SiO_2 (Head) by northing, MINZON 1001, Moonshine*

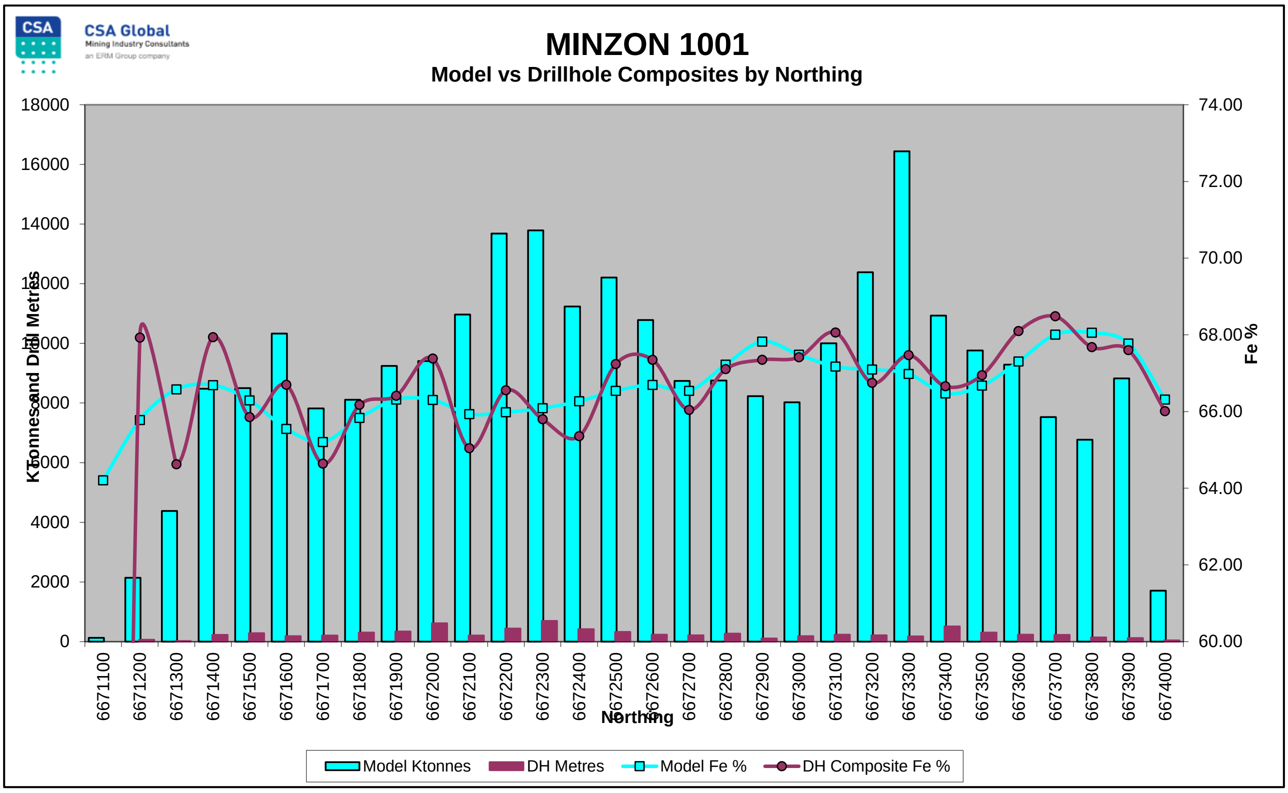

Figure 60: *Swath plot, Fe (Concentrate) by northing, MINZON 1001, Moonshine*

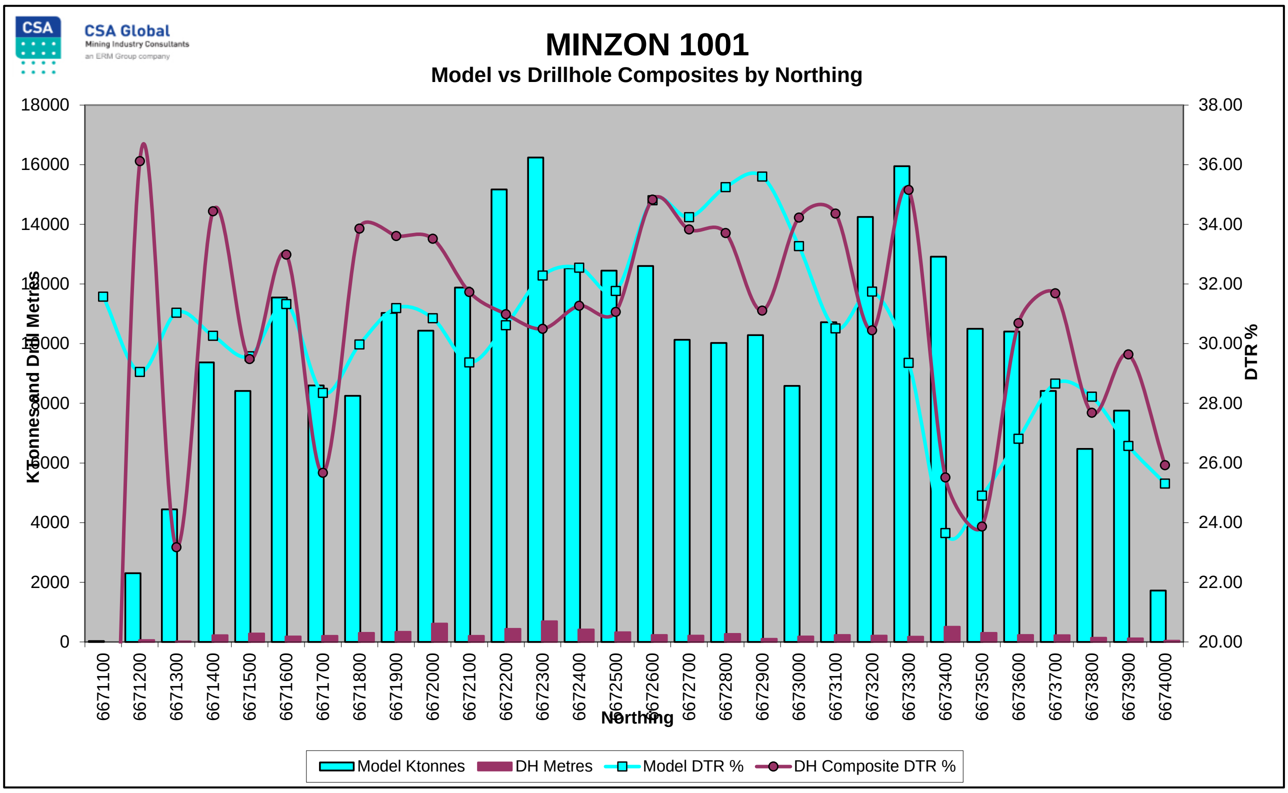

Figure 61: Swath plot, mass recovery by northing, MINZON 1001, Moonshine

14.3.14 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 drillhole 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 two to three holes per section. The Measured volumes also contain samples subject to DTR testwork, with associated assays from the recovered concentrates. Bulk density 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 testwork, with associated assays from the recovered concentrates. Bulk density 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 drillhole, and the geological models are strongly guided by surface mapping of the BIF outcrops. Drill spacing is typically ≥100 m along the northerly strike. DTR and bulk density results are generally absent from within the Inferred volumes.

Figure 62 and Figure 63 demonstrate the application of the classification to the Mineral Resource estimate.

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

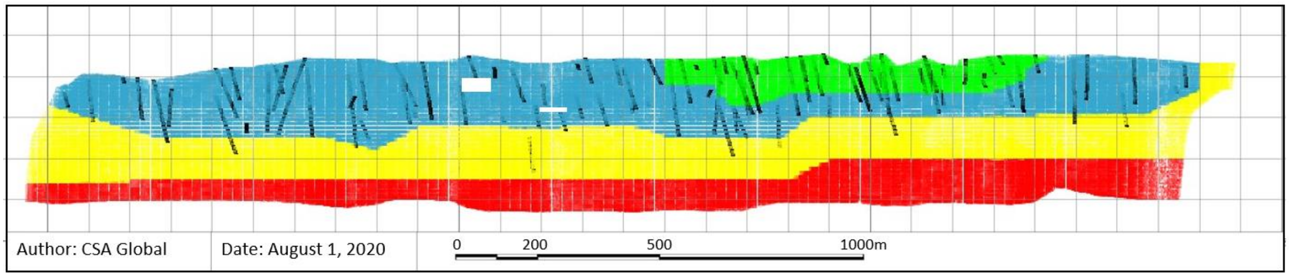

Figure 62: Longitudinal section of Moonshine (west) domain, showing Mineral Resource classification

Note: Green = Measured; cyan = Indicated; yellow = Inferred; red=unclassified; and drillhole intercepts (black traces). Grid square 100 m. View to east.

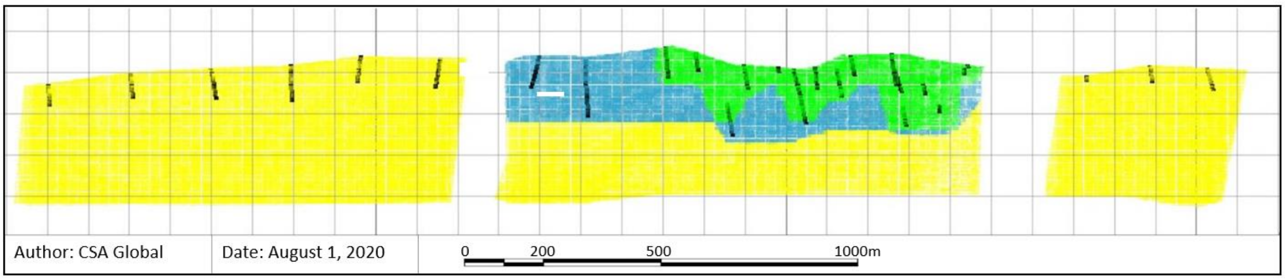

Figure 63: Longitudinal section of Moonshine North (west) domain, showing Mineral Resource classification

Note: Green = Measured; cyan = Indicated; yellow = Inferred; and drillhole intercepts (black traces). Grid square 100 m. View to east.

14.3.15 Reasonable Prospects Hurdle

The QP believes there are reasonable prospects for eventual economic extraction of the Mineral Resource.

It is assumed 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.

The Project is located 200 km to the northwest of Kalgoorlie-Boulder, which is a regional centre supporting a vibrant mining industry, with a population of approximately 30,000. A sealed road and an all-weather unsealed road allow year-round access to the Project.

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 is located approximately 90 km south of the Project and runs direct for 500 km to the Port of Esperance. The rail network operates on an open access regime and currently services iron ore mines to the west of the Project as detailed in Section 15.

The Port of Esperance is owned by the Western Australian Government and 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.

The market price for 65% Fe fines is currently over US$140 (A$192) per dry metric tonne at the Effective Date of this Mineral Resource (www.businessinsider.com) and has shown a steady climb in price over the past four years from a low of US$82 (A$ 109) in mid-2017.

The Yilgarn and Midwest regions of Western Australia host a number of similar BIF hosted magnetite deposits including one operational magnetite mine, the Karara magnetite project, operated by Karara Mining Limited. The QP has undertaken a review of the Mineral Resource estimates and operating assumptions presented in scoping studies and publicly reported information to the ASX for the Karara magnetite project, Mount Ida magnetite project (Jupiter Mines Limited), Telecom Hill iron ore deposit, (Austsino Resources Group Limited) and Yerecoin magnetite deposit (Cliffs) in the Yilgarn Craton. These projects are considered analogous to the Lake Giles Magnetite Project in respect of deposit style, geographical location, Mineral Resource estimation and reporting criteria.

Mineral Resources of these projects were reported to a similar depth as the Inferred Mineral Resources of the Lake Giles Magnetite Project with estimated Free on Board costs in the range of A$57 to A$90 for open pit mining scenarios. Cut-off grades and DTR parameters presented below are in line with the those used for the Lake Giles Magnetite Project:

- Mount Ida: 10% magnetite Fe cut off; DTR P80 25 micron (SRK, 2018)
- Yerecoin: 15% DTR cut-off; DTR P85 75 micron (Cliffs, 2012)
- Telecom Hill: 15% DTR cut-off; DTR P80 38 micron (Austsino, 2017)
- Karara: 20% DTR cut-off; DTR P80 35 micron (Gindalbie Metals, 2007).

The Karara magnetite Mineral Resource was reported in accordance with the JORC Code (2004), with reporting based on a DTR mass recovery above 20% and reported to a depth of 400 m below surface (Gindalbie Metals, 2007). The cut-off parameter of 20% DTR is marginally above the cut-off used for the Lake Giles magnetite deposits. Iron head grades and concentrate iron grades are considered in line with estimates reported for the Lake Giles Magnetite Project. Metallurgical testwork for the Karara project was based on a grind size of 80% passing 35 microns to achieve a product concentrate grade of 68.2% Fe. This grind size is slightly finer than the DTR testwork for the Lake Giles Magnetite Project at P80 45 microns that reported a concentrate grade ranging between 62.4% and 66.1%. These grades are considered within required ranges to achieve the specifications for the iron ore fines market. The Karara project commenced mining in 2011 and is currently producing magnetite concentrate for export through Geraldton Port in Western Australia. The project logistics, geographical setting and deposit style are considered analogous to the Lake Giles Magnetite Project.

Macarthur is not aware of any significant environmental reasons why environmental approval is unlikely to be granted for the Project.

Tenure over the property is granted for at least another eight years with the option to extend, and annual expenditure payments have been diligently paid by Macarthur. The Australian system of government is very stable, with the major political parties supportive of the mining industry. Mining of iron mineralisation in Western Australia is a major contributor to the State's economy and the development of iron projects is supported at a government level, assuming all relevant approvals can be obtained.

The QPs are not aware of any potential issues regarding environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors, that could materially affect the Mineral Resource estimate.

14.3.16 Reporting of Mineral Resource Estimate

Mineral Resources are reported at an Effective Date of 29 September 2020.

Mineral Resources for Moonshine and Moonshine North are shown in Table 24 to Table 26. Mineral Resources are reported above a DTR cut-off of 15%. 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).

Table 24: Mineral Resource estimate, Moonshine and Moonshine North, where DTR >15%

Category	Tonnes (Mt)	Head grade (%)					Concentrate grade (%)					
		Fe	P	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	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
Subtotal	**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 25: Mineral Resource estimate, Moonshine, where DTR >15%

Category	Tonnes (Mt)	Head Grade (%)					Concentrate Grade (%)					
		Fe	P	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	LOI
Measured	34.4	28.2	0.045	51.5	1.2	1.7	30.6	65.8	0.013	6.9	0.2	-0.6
Indicated	193.0	27.1	0.045	52.1	1.4	1.4	30.5	66.5	0.014	6.3	0.1	0.0
Subtotal	**227.4**	**27.3**	**0.045**	**52.0**	**1.4**	**1.4**	**30.5**	**66.4**	**0.014**	**6.4**	**0.1**	**-0.1**
Inferred	167.5	27.0	0.047	52.4	1.3	1.4	30.4	66.0	0.016	7.2	0.1	0.0

Table 26: Mineral Resource estimate, Moonshine North, where DTR >15%

Category	Tonnes (Mt)	Head Grades (%)					Concentrate Grade (%)					
		Fe	P	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	LOI
Measured	19.5	35.3	0.060	34.7	2.5	4.3	34.9	66.4	0.062	5.0	0.3	-0.9
Indicated	25.7	30.5	0.050	43.6	1.4	3.1	35.2	63.5	0.041	9.1	0.2	-0.5
Subtotal	**45.2**	**32.6**	**0.055**	**39.8**	**1.9**	**3.6**	**35.1**	**64.7**	**0.050**	**7.3**	**0.3**	**-0.7**
Inferred	281.7	27.1	0.048	52.7	0.8	1.4	28.5	64.5	0.033	9.1	0.1	0.0

Notes:

- *The Mineral Resource estimate was prepared by David Williams, B.Sc., MAIG, a CSA Global employee, and the Qualified Person for the estimate*
- *Mineral Resources were estimated using Datamine Studio RM (Version 1.6.87).*
- *Assays were composited to regular 1 m or 5 m intervals, dependent upon the deposit.*
- *Composite assay grades were capped as required. Fe and DTR grades were not capped.*
- *Block-model grade interpolation was undertaken using ordinary kriging.*
- *Bulk density was calculated for each block in the Moonshine model using algorithms, based upon the estimated Head Fe block grade. Average bulk density of 3.3 t/m^3 was applied to the other deposit models.*
- *Mineral Resources are reported from a model with parent block dimensions of 25 m x 25 m x 10 m.*
- *Tonnage and grade have been rounded to reflect the relative accuracy of the Mineral Resource estimate; therefore, columns may not total due to rounding.*
- *Resource classification is as defined by the Canadian Institute of Mining, Metallurgy and Petroleum in their document "CIM Definition Standards for Mineral Resources and Mineral Reserves" of 10 May 2014.*
- *Mineral Resources that are not Mineral reserves do not have demonstrated economic viability.*
- *The QP and Macarthur are not aware of any current environmental, permitting, legal, title, taxation, socio-economic, marketing or political factors that might materially affect these Mineral Resource estimates.*

14.4 Sandalwood, Clark Hill North, Clark Hill South and Snark

14.4.1 Drillhole Database

The drillhole data was provided by Macarthur in a Microsoft Access format comprising collar, survey, assay, lithological and weathering data. Drillhole statistics are presented in Table 27. The database was provided to CSA Global on 20 October 2009, with no additional data related to the Lake Giles Magnetite Project, excluding the Moonshine and Moonshine North deposits, provided thereafter.

Table 27: Drilling data as of 20 October 2009

Deposit	No. of holes	No. of samples	Total metres
Clark Hill North	53	1,511	8,589
Clark Hill South	5	215	1,270
Sandalwood	27	1,029	6,050
Snark	16	487	2,969
Total	**101**	**3,242**	**18,878**

Assay data presenting as negative values were treated as missing samples, and the assay grades set to absent. All assay fields were set to their appropriate oxidation state during importation of data from the laboratory certificates into the database.

Drillhole database tables were imported into Datamine and checks carried out for erroneous drillhole collars, sample overlaps, and any missing data. A drillhole file was created in Datamine capturing collar, survey, assay, geology, DTR and density data.

Drillhole collar plot for the deposits are presented in Section 10.1.

14.4.2 Topography

A DTM of the topography, imported from contour maps of the Project area, was imported into Datamine and saved as a wireframe surface. The surface was validated against several drill collars, representing different geographical locations of the resource, to ensure matching elevation levels between drillhole survey and topographic survey. The topographic survey is considered adequate to support the Mineral Resource estimates.

14.4.3 Geological Interpretation

Mineralisation domains were interpreted and modelled in cross section, using drillhole logging and sample analyses to guide the interpretation. The interpretation and wireframes were generated based on a 100 m x 50 m and 200 m x 100 m exploration drilling patterns.

Wireframe solids were generated based on the sectional interpretations provided by Macarthur to delineate the mineralisation domains. A lower cut-off of 15% Fe combined with the geological logging was used to define the mineralised envelopes.

A base of oxidation surface was modelled using the geological logging, magnetic susceptibility of drill samples, and the mass recovery results from the sample analyses. Mineral Resources are only reported below the base of oxidation.

14.4.4 Sample Coding

Drillhole samples within the Datamine drillhole files were flagged with unique codes according to the mineralisation and weathering domain within which they were located.

14.4.5 Sample Compositing

Analysis of the exploration data intervals showed the majority of the raw sample intervals are between 1 m to 5 m in length, but there are a number of non-regular sample data. The raw samples range in length from 0.18 m to 12.0 m, with about 45% being 5 m. The 5 m length was considered appropriate for compositing to retain the original data variability. Use of this composite size minimised splitting of raw samples to smaller intervals.

Compositing was completed to honour the geological boundaries of the mineralised lodes by breaking the composites at the lode boundaries. This process resulted in sample lengths of <5 m at lode contacts. Approximately 1% of the composites have a length less than or equal to 1.1 m.

14.4.6 Statistical Analyses

Statistical summaries for key grades from composited sample data within the mineralisation domains are presented in Table 28 to Table 35. The data show the result of separating the magnetite from the whole sample using the Davis Tube method, with Fe grades significantly higher in the product, and a corresponding material decrease in silica and phosphorous grades. The higher silica and phosphorous grades are associated with silica and non-magnetic minerals caught in the gangue material, such as the siliceous bands in the host BIF rock.

Table 28: Summary statistics, head grades – Sandalwood (values in %); P_2O_5 values were stoichiometrically adjusted to P at this stage of work

Statistic	**Al_2O_3**	**Fe**	**LOI**	**P_2O_5**	**S**	**SiO_2**
Number	281	281	281	281	281	281
Minimum	0.02	12.1	-1.8	0.07	0.002	25.1
Maximum	11	47.3	4.1	0.3	2.6	60.2
Mean	1.58	30.85	-0.63	0.16	0.18	48.4
Standard deviation	2.33	5.66	0.92	0.027	0.3	4.02
Variance	5.41	32.05	0.85	0.001	0.09	16.19
Coefficient of variation	1.47	0.18	-1.47	0.18	1.62	0.08

Table 29: Summary statistics, concentrate grades – Sandalwood (values in %)

Statistic	**Al_2O_3**	**Fe**	**LOI**	**P**	**S**	**SiO_2**	**DTR**
Number	275	275	275	275	275	275	281
Minimum	0.005	51.7	-3.7	0.005	0.002	1.5	0.59
Maximum	0.7	70.9	0.2	0.079	6.8	25.9	57.2
Mean	0.069	64.7	-2.77	0.031	0.27	9.47	33.0
Standard deviation	0.095	3.45	0.5	0.014	0.62	4.62	11.35
Variance	0.009	11.9	0.25	0.001	0.39	21.32	128.9
Coefficient of variation	1.37	0.05	-0.18	0.442	2.3	0.49	0.34

Table 30: Summary statistics, head grades – Clark Hill North (values in %)

Statistic	**Al_2O_3**	**Fe**	**LOI**	**P**	**S**	**SiO_2**
Number	443	443	421	243	440	443
Minimum	-0.01	3.3	-3.58	0.021	-0.001	25.6
Maximum	14.6	41.5	17.1	0.137	4.9	65.6
Mean	1.97	28.3	0.27	0.063	0.28	47.1
Standard deviation	2.88	9.36	2.6	0.022	0.54	4.39
Variance	8.29	87.6	6.74	0.001	0.29	19.26
Coefficient of variation	1.46	0.33	9.69	0.36	1.91	0.09

Table 31: Summary statistics, concentrate grades – Clark Hill North (values in %)

Statistic	**Al_2O_3**	**Fe**	**LOI**	**P**	**S**	**SiO_2**	**DTR**
Number	262	262	-	189	261	262	268
Minimum	0.005	40.3	-	0.003	0.001	2.1	0.2
Maximum	4.96	70.7	-	0.14	2.76	26.9	68.2
Mean	0.17	63.2	-	0.042	0.26	10.8	32.6
Standard deviation	0.37	4.56	-	0.024	0.48	5.4	14.4
Variance	0.14	20.75	-	0.001	0.23	29.4	208
Coefficient of variation	2.13	0.07	-	0.57	1.9	0.5	0.44

Table 32: Summary statistics, head grades – Clark Hill South (values in %)

Statistic	**Al_2O_3**	**Fe**	**LOI**	**P**	**S**	**SiO_2**
Number	11	11	11	11	11	11
Minimum	0.09	20.13	0.00	0.05	0.00	43.69
Maximum	4.75	35.88	0.16	0.07	0.27	49.62
Mean	0.64	32.63	0.02	0.06	0.08	47.06
Standard deviation	1.37	4.51	0.05	0.01	0.11	2.06
Variance	1.89	20.30	0.00	0.00	0.01	4.22
Coefficient of variation	2.17	0.14	3.10	0.11	1.32	0.04

Table 33: *Summary statistics, concentrate grades – Clark Hill South (values in %)*

Statistic	Al_2O_3	Fe	LOI	P	S	SiO_2	DTR
Number	11	11	-	11	11	11	11
Minimum	0.02	59.40	-	0.01	0.00	5.50	5.47
Maximum	0.27	67.00	-	0.03	0.16	15.80	48.90
Mean	0.08	62.35	-	0.02	0.05	12.26	36.37
Standard deviation	0.07	2.47	-	0.01	0.06	3.24	14.41
Variance	0.01	6.10	-	0.00	0.00	10.52	207.56
Coefficient of variation	0.90	0.04	-	0.29	1.23	0.27	0.40

Table 34: *Summary statistics, head grades – Snark (values in %)*

Statistic	Al_2O_3	Fe	LOI	P	S	SiO_2
Number	119	119	81	109	119	119
Minimum	0.1	9.9	-0.9	0.035	0.008	31.3
Maximum	12.6	40.2	8.7	0.125	1.1	69.6
Mean	1.92	28.8	2.03	0.067	0.161	47.9
Standard deviation	2.65	6.0	1.82	0.014	0.18	5.3
Variance	7.0	36.3	3.31	0.000	0.03	28.4
Coefficient of variation	1.38	0.21	0.9	0.20	1.12	0.11

Table 35: *Summary statistics, concentrate grades – Snark (values in %)*

Statistic	Al_2O_3	Fe	LOI	P	S	SiO_2	DTR
Number	69	69	66	69	69	69	67
Minimum	0.008	55.5	-3.4	0.016	0.001	2.44	0.74
Maximum	0.81	70.9	-2.1	0.066	2.1	21.4	37.0
Mean	0.15	66.3	-2.83	0.028	0.33	7.23	24.3
Standard deviation	0.15	3.36	0.3	0.009	0.38	4.16	8.43
Variance	0.02	11.3	0.09	0.00	0.14	17.3	71.0
Coefficient of variation	0.96	0.05	-0.11	0.32	1.13	0.57	0.35

14.4.7 Top Cutting of Grades

Top cuts were applied to the Sandalwood, Clark Hill North, Clark Hill South, or Snark composited sample assays, where appropriate. Top cuts were selected and applied if there was an extended high-grade tail on the histogram of results within the mineralisation domains.

The samples with grades greater than the nominated top cut grades values were reviewed in Datamine to determine if they were clustered with other data or located in isolation.

No bottom cutting of grades was used.

14.4.8 Variography

A discussion on the use of variography is provided in Section 14.3.9.

Variograms for Sandalwood top cut and composited sample data were modelled after combining all mineralisation domains into a single population due to the low count of sample numbers. Traditional semi-variograms were modelled.

Variograms were modelled from head and concentrate assays for Fe, SiO_2, Al_2O_3, LOI and S, with a variogram also modelled for the P (concentrate) and DTR sample data. The variograms were poorly structured due to very sparse data. Results are presented in Table 36. Due to low numbers of samples for the other deposits, it was not possible to model variograms. The Sandalwood variogram parameters were applied to these models during grade interpolation.

Table 36: Variogram sills and ranges, Sandalwood

Grade variable	Axes	Direction	Nugget	Sill 1	Range 1 (m)	Sill 2	Range 2 (m)
Fe (Head)	1	80→040	0.55	0.2	49	0.25	155
	2	10→220			16		83
	3	0→130			44		144
SiO_2 (Head)	1	80→040	0.55	0.21	260	0.24	420
	2	10→220			77		175
	3	0→130			85		200
Al_2O_3 (Head)	1	50→040	0.22	0.4	50	0.38	128
	2	40→220			50		55
	3	0→130			400		620
LOI (Head)	1	80→060	0.28	0.23	36	0.49	131
	2	10→240			128		410
	3	0→150			450		810
S (Head)	1	50→040	0.28	0.29	24	0.43	116
	2	40→220			40		100
	3	0→130			49		150
Fe (Concentrate)	1	80→040	0.16	0.54	28	0.3	58
	2	10→220			120		240
	3	0→130			265		333
P (Concentrate)	1	50→040	0.18	0.51	54	0.31	160
	2	40→220			34		95
	3	0→130			42		164
SiO_2 (Concentrate)	1	80→050	0.22	0.4	30	0.38	104
	2	10→230			50		89
	3	0→130			105		230
Al_2O_3 (Concentrate)	1	80→040	0.35	0.11	26	0.54	86
	2	10→220			118		340
	3	0→130			72		370
S (Concentrate)	1	70→080	0.55	0.19	80	0.26	133
	2	20→260			180		365
	3	0→170			630		630
LOI (Concentrate)	1	80→040	0.1	0.35	24	0.55	77
	2	10→220			63		255
	3	0→130			63		255
Mass recovery	1	80→040	0.45	0.29	40	0.26	88
	2	10→220			18		93
	3	0→130			18		93

14.4.9 Density

Density measurements were taken from drill sample data located at Clark Hill. A total of 122 diamond core billets were taken from four diamond holes, with 63 of the samples located within the BIF host rock. Density measurements were taken using a conventional Archimedes technique. Discussion is provided in Section 10.5.

A review of results by Allen (2009) showed some very low values and some very high results, which were excluded from the dataset. A statistical analysis determined an average density value of 3.3 t/m^3 for all samples, and 3.4 t/m^3 for BIF samples. The global mean result of 3.3 t/m^3 was applied to the Mineral Resource block model and is a typical density value for magnetite mineralisation hosted by BIF. The QP considered there to be insufficient number of samples to model an algorithm for density, as was used for the Moonshine Mineral Resource (Section 14.3.10).

14.4.10 Block Model

Separate block models were prepared for Sandalwood, Clark Hill North, Clark Hill South, and Snark.

Block model parameters are shown in Table 37.

The northing parent cell sizes were selected based on approximately half of the average drill section spacing. The model cell dimensions in other directions were selected to provide sufficient resolution to the block model in the across-strike and down-dip directions.

The volume block models were validated on screen to ensure blocks were coded correctly according to the input wireframes.

Table 37: Block model dimensions and parameters

	X	Y	Z
Sandalwood krgmod2d			
Origin	788,400	686,800	180
Extent	4,100	9,700	340
Block size (sub-block)	50 m (5 m)	50 m (5 m)	10 m (2 m)
Clark Hill North krgmod2d			
Origin	783,800	694,400	180
Extent	4,200	2,100	340
Block size (sub-block)	50 m (5 m)	50 m (5 m)	10 m (2 m)
Clark Hill South chs_v2			
Origin	786,000	691,500	150
Extent	2,400	2,700	400
Block size (sub-block)	10 (1)	100 (2)	50 (2)
Snark krgmod2d			
Origin	780,900	695,500	180
Extent	5,500	4,700	340
Block size (sub-block)	50 m (5 m)	50 m (5 m)	10 m (2 m)
Attributes:			
MINZON	Mineralisation Domain		
OXID	Weathering Domain. 0 = Oxide, 3 = Fresh		
PARTORE [1]	Used to apply tonnage reduction during reporting (Sandalwood only)		
Head grades	Estimated grades (ordinary kriging): Fe, Al_2O_3, LOI, P, S, SiO_2		
Concentrate grades	Estimated grade (ordinary kriging): FE_C, AL2O3_C, LOI_C, P_C, S_C, SiO2_C		
DTR	Estimated mass recovery (DTR) grade (ordinary kriging)		
CLASS	1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Unclassified		
DENSITY	Calculated or assigned bulk density		

Note (1): PARTORE was used to limit the volumes of modelled mineralisation that could be reported as Mineral Resources. Only those volumes within 200 m of a drillhole were reported.

14.4.11 Grade Interpolation

All head and concentrate grades from top cut and composited data, as detailed in Table 23, were interpolated into the parent cells by ordinary kriging. Blocks were estimated using a search ellipse of 300 m (major) x 100 m (semi-major) x 100 m (minor) dimensions, with a minimum of 12 and maximum of 30 samples from a maximum of six samples per drillholes. Search radii were increased, and the minimum number of samples reduced in subsequent sample searches if cells were not interpolated in the first two passes. Cell discretisation of 3 x 3 x 3 (X, Y, Z) was employed.

Hard boundary estimation was used when estimating within the mineralisation domains, such that samples from one mineralisation domain could not be used to interpolate blocks in an adjacent domain.

14.4.12 Block Model Validation

Model validation was carried out graphically and statistically to ensure that block model grades accurately represent the drillhole data. Drillhole cross-sections were examined to ensure that model grades honour the local composited drillhole grades.

A number of statistical methods were employed to validate the block model, including:

- Comparison of block grade with nearest composites
- Comparison of kriged model and composite populations.

Results showed that the grade interpolation had performed as intended, with block grades reasonably reflecting the input sample grades. Validation methods and their results should be reviewed as a package and opinions should not be formed on the performance of the model on one set of data.

A swath plots for the estimated DTR block grades and input composited sample data for Sandalwood is presented in Figure 64. This demonstrates some smoothing of interpolated block grades compared to input sample data, but the sample data trends can be observed in the block grade distribution.

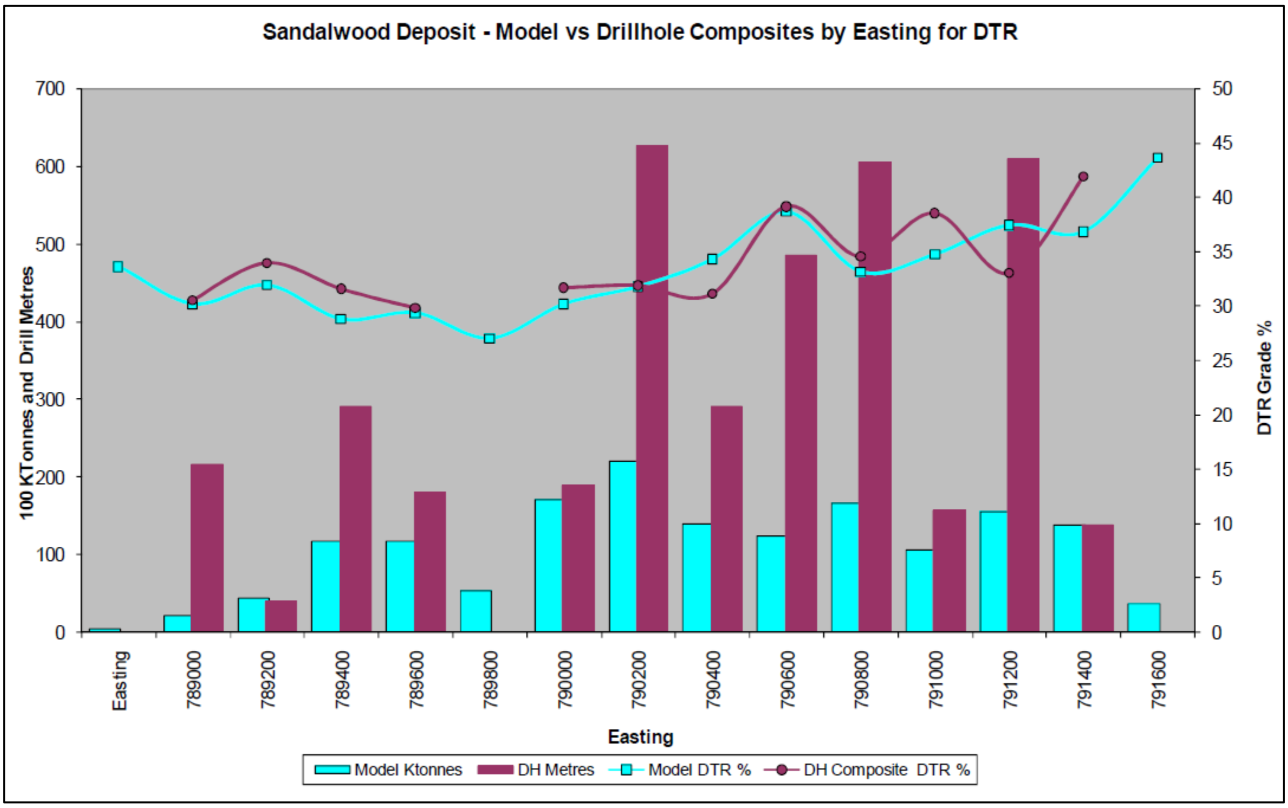

Figure 64: Swath plot, DTR, by easting – Sandalwood

14.4.13 Mineral Resource Classification

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 drillhole spacing. Sandalwood, Clark Hill North, Clark Hill South, and Snark are classified as Inferred.

The Inferred Mineral Resource classification is based upon an implied understanding of the geological and grade continuity. Some mineralisation domains are only cut by one drillhole, and the geological models are strongly guided by surface mapping of the BIF outcrops.

All available data was assessed and the QP's relative confidence in the data was used to assist in the classification of the Mineral Resource.

The current classification assignment appropriately reflects the QP's view of the deposits.

14.4.14 Reasonable Prospects Hurdle

The QP believes there are reasonable prospects for eventual economic extraction of the Mineral Resource.

It is assumed the 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.

The Project is located 200 km to the northwest of Kalgoorlie-Boulder, which is a regional centre supporting a vibrant mining industry, with a population of approximately 30,000. A sealed road and an all-weather unsealed road allow year-round access to the Project.

Other relevant discussion is provided in Section 14.3.15.

The QP is not aware of any potential issues regarding environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors, that could materially affect the Mineral Resource estimate.

14.4.15 Reporting of Mineral Resource Estimate

Mineral Resources are reported at an Effective Date of 29 September 2020.

Mineral Resources for Sandalwood, Clark Hill North, Clark Hill South, and Snark are shown in Table 38. Mineral Resources are reported above a DTR cut-off of 15%. 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).

Table 38: Mineral Resource estimate, Sandalwood, Clark Hill North, Clark Hill South, and Snark, where DTR >15%

Deposit	Category	Tonnes (Mt)	Head grade (%)				Concentrate grade (%)					
			Fe	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	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

Notes:

- *The Mineral Resource estimate was prepared by David Williams, B.Sc., MAIG, a CSA Global employee, and the Qualified Person for the estimate.*
- *Mineral Resources were estimated using Datamine Studio RM (Version 1.6.87).*
- *Assays were composited to regular 1 m or 5 m intervals, dependent upon the deposit.*
- *Composite assay grades were capped as required. Fe and DTR grades were not capped.*
- *Block-model grade interpolation was undertaken using ordinary kriging.*
- *Bulk density was calculated for each block in the Moonshine model using algorithms, based upon the estimated Head Fe block grade. Average bulk density of 3.3 t/m3 was applied to the other deposit models.*
- *Mineral Resources are reported from a model with parent block dimensions of 25 m x 25 m x 10 m.*
- *Tonnage and grade have been rounded to reflect the relative accuracy of the Mineral Resource estimate; therefore, columns may not total due to rounding.*
- *Resource classification is as defined by the Canadian Institute of Mining, Metallurgy and Petroleum in their document "CIM Definition Standards for Mineral Resources and Mineral Reserves" of 10 May 2014.*
- *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*
- *The QP and Macarthur are not aware of any current environmental, permitting, legal, title, taxation, socio-economic, marketing or political factors that might materially affect these Mineral Resource estimates.*

14.4.16 Previous Mineral Resource Estimates

The Mineral Resources were previously reported in 2009 as per Table 39. The tenure covering the Sandalwood and Snark deposits has marginally reduced in area since that time, which required a re-reporting of the Mineral Resources within the adjusted tenure boundaries.

The Issuer is not treating the previous mineral resource estimates as current mineral resources. These previous mineral resource estimates are presented for historical information and context only. Current Mineral Resource estimates are presented in Section 14.4.15 of this report.

The QP reviewed the 2009 Clark Hill South Mineral Resource estimate and a decision was made to update the geological models to ensure only the mineralisation domains cut by drilling were used to report the Mineral Resource. This has resulted in a decrease of 51 Mt from the 2009 Mineral Resource. The QP is confident that additional drilling at the deposit will allow an increase to the Mineral Resource tonnages as currently reported at Clark Hill South, if Macarthur choose to pursue the development of the Clark Hill South deposit.

Table 39: Previous Mineral Resource estimate – not current, Sandalwood, Clark Hill North, Clark Hill South and Snark, where DTR >15%, as reported in 2009 (Allen, 2009) and 2010 (Macarthur, 2010)

Deposit	Category	Tonnes (Mt)	Head grade (%)				Concentrate grade (%)					
			Fe	SiO_2	Al_2O_3	LOI	DTR	Fe	P	SiO_2	Al_2O_3	LOI
Sandalwood	Inferred	335	31.1	-	-	-	33.1	64.0	0.031	9.64	0.07	-2.77
Snark	Inferred	75	27.7	-	-	-	-	-	-	-	-	-
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	66	30.3	-	-	-	-	-	-	-	-	-

15 Adjacent Properties

Macarthur is also managing the Ularring Hematite Project, located in the same regional area as the Moonshine Magnetite Project. Hematite is hosted in the same suite of BIF ridges as the magnetite but does not exist together with hematite in the same geological location. Hematite requires a separate metallurgical process and infrastructure making it distinctly different to the Lake Giles Magnetite Project discussed in this report.

A number of other companies hold almost all of the ground favourable for iron mineralisation exploration within approximately 100 km of the Lake Giles Magnetite Project. These include Mineral Resources Ltd, Mindax Ltd, Jupiter Mines Limited and Cashmere Iron Ltd.

Iron ore (DSO) mining operations are presently being undertaken by Mineral Resources Ltd at the Deception and Koolyanobbing deposits. Iron mineralisation has also been recently mined at the Windarling, Mount Jackson and Carina, owned by Mineral Resources Ltd. Figure 65 shows the Mineral Resources Ltd tenement holdings for its various iron projects in close proximity to Macarthur's Lake Giles Magnetite Project.

The QP has been unable to verify this information and the information is not necessarily indicative of the mineralisation on the property that is the subject of this Technical Report.

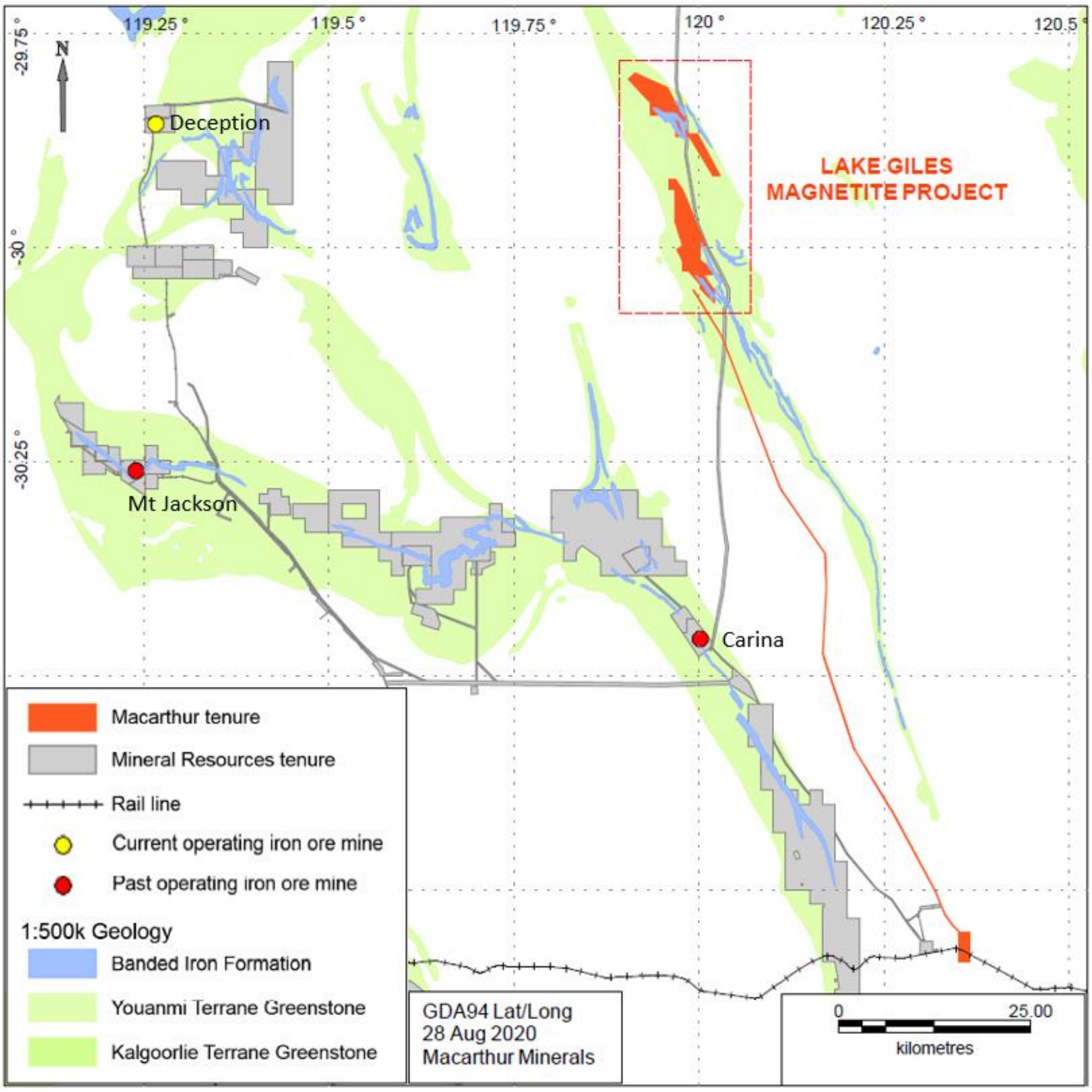

Figure 65: Surrounding tenure showing operating and past iron ore mines
Source: Macarthur (2020)

16 Other Relevant Data and Information

There is no other data or information that is relevant to this assessment of the Lake Giles Magnetite Project that has not been disclosed elsewhere in the document.

17 Interpretation and Conclusions

A Mineral Resource estimate has been prepared for the Lake Giles Magnetite Project, based upon a total of 352 RC drillholes and 21 diamond holes. Results from these drillholes, and from geological field mapping and observations, provided the basis for the geological interpretations. The Mineral Resource estimate was classified as a combination of Measured, Indicated and Inferred in accordance with 2014 CIM Definition Standards. The classification level is based upon an assessment of the geological understanding of the deposit, QAQC of the samples, mass recovery results, density data and drillhole spacing.

The outcropping iron mineralisation in the Project area is comprised of a combination of unaltered silica-rich BIFs and altered, enriched haematite/goethite BIFs. Weathering has resulted in the leaching of majority of the silica from the BIFs, thus producing a rock with elevated iron and decreased silica grades, near surface. These enriched bands vary from 10 m to 150 m in true thickness and are steeply dipping at 70–90°. The outcrop of weathered iron mineralisation is indicative of the fresh (non-weathered) magnetite mineralisation located down dip which is favourable for hosting a Mineral Resource.

The main zones of magnetite 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 magnetite mineralisation has been confirmed to in excess of 250 m below surface as demonstrated by results from several drillholes, confirming a consistent easterly dip of the hangingwall for the majority of the Moonshine and Moonshine North prospects.

The Lake Giles Magnetite deposits were drilled with either 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. Not all holes penetrated mineralisation.

Macarthur provided geological and mineralisation interpretations to CSA Global as 3D wireframe solids and surfaces. The drillhole 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) x 10 m (vertical). A larger block size of 50 m (along strike) x 50 m (across strike) x 10 m (vertical) was used for the magnetite deposits to the north of Moonshine (Sandalwood, Clark Hill North, Clark Hill South, and Snark). Head and concentrate grades, and mass recovery, were estimated into the block model using ordinary kriging.

For Moonshine and Moonshine North, a minimum of eight and maximum of 18 samples were used in any one block estimate, with a maximum of four samples per drillhole. Search ellipsoid radii varied between the deposits. Typically, a primary search ellipse of 240 m along strike and down plunge x 120 m down dip x 40 m across strike was used.

For Sandalwood, Clark Hill North, Clark Hill South and Snark, a minimum of 12 and maximum of 30 samples were used in any one block estimate, with a maximum of six samples per drillhole. Search ellipsoid radii of 300 m along strike and down plunge x 100 m down dip x 100 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 bulk density measurements were captured within the Moonshine and Moonshine North mineralisation domains and statistically assessed to determine the mean and ranges, and to see if any excessively low or high bulk density values were present. Three mineralisation domains contain bulk density data. A further 400 samples were taken from the BIF oxide zones, or the footwall and hangingwall waste zones. Core samples, both from the fresh and oxidised zones, were highly competent, without any fractures or voids, and were not required to be wax 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 iron grade from assays, and the corresponding bulk density 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.

For the Sandalwood, Clark Hill North, Clark Hill South, and Snark deposits, density measurements were taken from drill sample data located at Clark Hill. A total of 122 diamond core billets were taken from four diamond holes, with 63 of the samples located within the BIF host rock. The Sandalwood, Clark Hill North, Clark Hill South, and Snark Mineral Resources were all applied a density value of 3.3 t/m^3, which is a typical density value for the style of mineralisation, and is similar to the average bulk density at Moonshine and Moonshine North.

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 two to three holes per section. The Measured volumes also contain samples subject to DTR testwork, with associated assays from the recovered concentrates. Bulk density 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 testwork, with associated assays from the recovered concentrates. Bulk density 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 drillhole, and the geological models are strongly guided by surface mapping of the BIF outcrops. Drill spacing is typically ≥100 m along the northerly strike. DTR and bulk density 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 testwork results to support the reporting of concentrate grade estimates.

The Mineral Resources are based upon data collected over the history of the Project, all of which exhibit margins of error, whether natural or human induced. Examples are provided below:

- Drilling:
  - Downhole surveys provide estimates for the spatial location of drill samples. At downhole depths of >100 m, margins of error tend to increase. This is mitigated in the Mineral Resource via the Mineral Resource classification categories, with the deeper volumes, which are impacted more by potential errors in down hole survey locations of sample data, classified as Inferred, being the highest risk category.
  - Samples exhibit both natural and human induced errors. Macarthur's sampling procedures are designed to minimise or eliminate the human errors as much as possible, and the QPs are of the opinion that sampling error is minimised overall.
- Geological interpretations:
  - The geological logging of drill samples is a subjective exercise, and the results are used to guide the geological interpretations underpinning the Mineral Resource. Macarthur's geologists are experienced in geological logging of iron mineralisation and used sample analyses to confirm their logs. Macarthur's geological procedures are designed to minimise or eliminate the human errors as much as possible, and the QPs are of the opinion that any errors in the geological logs and geological interpretation are minimised overall.

- Bulk density, sample assays and DTR:
  - Bulk density testwork was carried out in accordance with Macarthur's procedures and results reflect those of other magnetite Mineral Resources reported from other properties, with a minimal margin of error. The classification categories for the Mineral Resource reflect the quantity of bulk density testwork.
  - Sample assays and DTR testwork was carried out by accredited analytical laboratories, in accordance with their own procedures, and their quality control protocols were followed. The classification categories for the Mineral Resource reflect the quantity of DTR testwork from local samples.
- Mineral Resource:
  - The Mineral Resource estimate combines all the above data, with their margins of error. The Mineral Resource is not a calculation and is referred to as an estimate due to the margins of error inherent in the input data. The Mineral Resource classification categories appropriately convey the risks for the various volumes within the magnetite mineralisation domains.

The Mineral Resource estimate is classified according to levels of risk (Measured, Indicated and Inferred), which are defined in Section 14.3.14. The highest levels of risk are in the Inferred Mineral Resources, and the risks can be reduced by additional drilling and associated geological and metallurgical studies, after the inclusion of their results in any future Mineral Resource estimates.

The interpretations and conclusions reached in this report are based on current geological understanding and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for absolute certainty. Any economic decisions which might be taken based on interpretations or conclusions contained in this report will therefore carry an element of risk.

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

18 Recommendations

18.1 Exploration Strategy and Budget

CSA Global recommend the following actions are completed to support the ongoing exploration and evaluation effort at the Lake Giles Magnetite Project:

- Continue to develop a deposit scale geological model incorporating lithology, mineralisation, weathering and structural features that locally control the occurrence and location of BIF host rock.
- Consider domaining a zone exhibiting higher magnetite concentration, and lower silica levels, for future Mineral Resource estimates. The domain would need to exhibit sufficient strike and down dip extent to be justified for future use.
- Maintain field geological procedures with respect to drill rig inspections and sampling procedures, vetting the maintenance and cleanliness of sample splitters and sample recovery.
- Monitor the performance of CRMs and field duplicates immediately upon receipt of assays.
- Macarthur geologists to compile a QAQC report prior to future Mineral Resource estimates.
- Merge the drillhole databases containing the pre-2019, and 2019 drill data.

Complete additional drilling in Indicated, Inferred and un-classified Mineral Resource areas to increase geological confidence of individual mineralised units. This will require budgeting of money and resources and will require a time frame of at least 10 months from initial drillhole planning and budgetary approval, to final receipt of sample assays. A proposed budget is provided in Table 40 (excludes fixed costs).

Table 40: Proposed exploration budget (A$)

Project	Work Program	Cost
Moonshine / Moonshine North	Extensional RC Drilling - 2500m	$500,000
	Assay samples	$200,000
	Site Prep/Rehab	$20,000
	Consumables	$10,000
Sandalwood, Clark Hill, Snark	No further work proposed	
Total		**$730,000**

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20 Abbreviations and Units of Measurement

Below are brief descriptions of some terms used in this report. For further information or for terms that are not described here, please refer to internet sources such as Wikipedia (www.wikipedia.org).

°	degrees
°C	degrees Celsius
3D	three-dimensional
A$	Australian dollars
Adex	Adex Holdings Limited
Al_2O_3	alumina
ASX	Australian Securities Exchange
Au	gold
Aztec	Aztec Mining Company Ltd
Battle Mountain	Battle Mountain Australia Incorporated
BIF	banded iron formation
CaO	calcium oxide
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CMP	Conservation Management Plan
CRM	certified reference material
CSA Global	CSA Global Pty Ltd
DEC	Department of Environment and Conservation
DMIRS	Department of Mines, Industry Regulation and Safety
DSO	direct shipping ore
DTM	digital terrain model
DTR	Davis Tube Recovery
EPA	Environmental Protection Authority
EP Act	Environmental Protection Act 1986
EPBC Act	Environment Protection and Biodiversity Act 1994
Evanston	Evanston Mines NL
Fe	iron
g	gram(s)
g/t	grams per tonne
GDA94	Geocentric Datum of Australia
GPS	global positioning system
GSWA	Geological Survey of Western Australia
H&S	Hellman & Schofield Pty Ltd
ha	hectares
Internickel	Internickel Australia Pty Ltd
kg	kilogram(s)
km, km^2	kilometre(s), square kilometre(s)
KNA	kriging neighbourhood analysis
LiDAR	light detection and ranging (survey method)

LIMS	low intensity magnetic separator
LOI	loss on ignition
m	metre(s)
Macarthur	Macarthur Minerals Limited
magnetite	A magnetic species of iron oxide with chemical formula Fe_3O_4
MgO	magnesium oxide
MIO	Macarthur Iron Ore Pty Ltd
mm	millimetres
MnO	manganese oxide
Mt	million tonnes
Mtpa	million tonnes per annum
NATA	National Association of Testing Authorities
NES	National Environment Significance
NI 43-101	National Instrument 43-101
Noble	Noble Resources NL
Normandy	Normandy Exploration Ltd
P	phosphorus
POW	program of works
ppb	parts per billion
QAQC	quality assurance/quality control
QP	Qualified Person
RAB	rotary air blast
RC	reverse circulation (refer to drilling method)
RTK	real time kinematic
S	sulphur
SGS	SGS Australia Pty Ltd
SiO_2	silica
t/m^3	tonnes per cubic metre
TGA	thermo-gravimetric analyser
Titan	Titan Resources NL
Ultramafic	Igneous rocks with very low silica content and high content of iron- and magnesium-bearing minerals
US$	United States dollars
XRF	x-ray refraction (analytical method)

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35 YEARS

1984 - 2019