



**ASX Announcement**

**4 April, 2018**

**UPDATED CORPORATE PRESENTATION & MD INTERVIEW**

Hexagon Resources Limited (ASX: **HXG**) is pleased to advise that it has posted the attached updated corporate presentation, “Batteries and Beyond - *recharged*” on its website. This presentation introduces the Company and summarises recent milestones including the recently announced earn-in joint venture with Mineral Resources Limited (refer ASX report “Stage 1 McIntosh Graphite Development Now Fully Funded” released on 27 March, 2018).

As well, a link is provided below to a recent video interview with Hexagon’s Managing Director, Mike Rosenstreich discussing the Mineral Resources transaction where Mineral Resources will fully fund all of the development costs of the McIntosh Graphite Project to earn a 51% equity stake, subject to Hexagon shareholder approval and completion of a positive feasibility study.

The video is available at: <https://youtu.be/GzwncAHZS5E>

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# McIntosh Graphite™ *Batteries and beyond...*

*\*updated & recharged 3 April, 2018*

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Mike Rosenstreich  
Managing Director  
*\*January, 2018*

# Highlights



## Fully funded, high-quality, advanced graphite asset in a safe jurisdiction

- ✓ McIntosh is a unique, high purity graphite deposit
- ✓ Stage 1 project to produce c. 100ktpa of graphite concentrates for a diverse range of premium priced end uses
- ✓ Exceptional downstream processing attributes and cost profile making it a highly sought after material by intermediate processors:
  - easily purified to Ultra high purity; “5N’s”
  - easily expandable (electronics market)
  - easily spheroidised (batteries)
  - excellent crystallinity - highly ordered structure including “HOPG”
- ✓ Stage 1 Project – fully funded to commercial production with Mineral Resources (ASX:MIN) earning 51% project interest (subject to HXG shareholder vote & positive Feasibility Study)
- ✓ Safe, stable jurisdiction with Project located in Western Australia

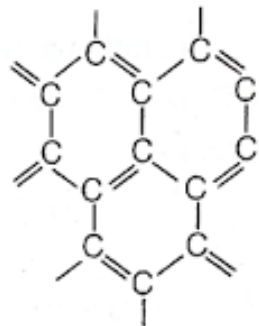
## Hexagon –what’s next?

- growth via 49% interest in fully funded Stage 1 McIntosh Project;
- Advancement of downstream graphite processing opportunities; and
- looking for new specialty or advanced materials opportunities.

# Who & What

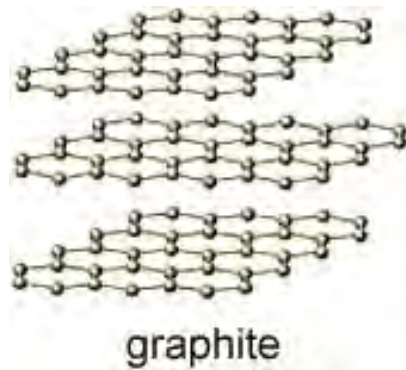


**ASX:HXG** is an emerging speciality materials company currently focussed on developing an advanced high-quality graphite project located in Western Australia.



Graphite

Plan view: graphite molecule



graphite

Side view: layers of graphite molecules;  
also referred to as graphene layers

**Flake Graphite** – a speciality mineral with recent upsurge in demand related to energy storage/EV revolution but also increasing demand from a range of high-tech and industrial applications.

# Graphite Market - Global Market Context for McIntosh products



## Key Facts

- Scale – 2.4mtpa of graphite traded around the World comprising:
  - 1.5 mtpa of synthetic graphite; and
  - 0.85 mtpa of natural (mined) graphite.
  - 76% of all graphite is from China
- Natural graphite market comprises:
  - 0.53 mtpa Flake
  - 0.3 mtpa amorphous
  - .01 mtpa vein-flake
- Natural graphite sources by country:
  - China – 0.6mtpa (50:50 flake:amorphous, with flake now almost entirely fine and small sized flake.
  - Brazil – 0.01mtpa, followed by India, Canada and Ukraine
- Synthetic graphite:
  - precursor material is a by product from petroleum refining (PetCoke + other varieties)
  - produced by “graphitisation process” – effectively unchanged since the 1800’s – involves heating in a kiln for 3 weeks at 2,000 to 3,000<sup>0C</sup>; quality is related to baking time and temperature (and feedstock).



HEXAGON

Source:

\* Various including, NAmLabs, Benchmark Minerals & 2016 figures from Roskill

# Graphite Market - Global Market Context for McIntosh products

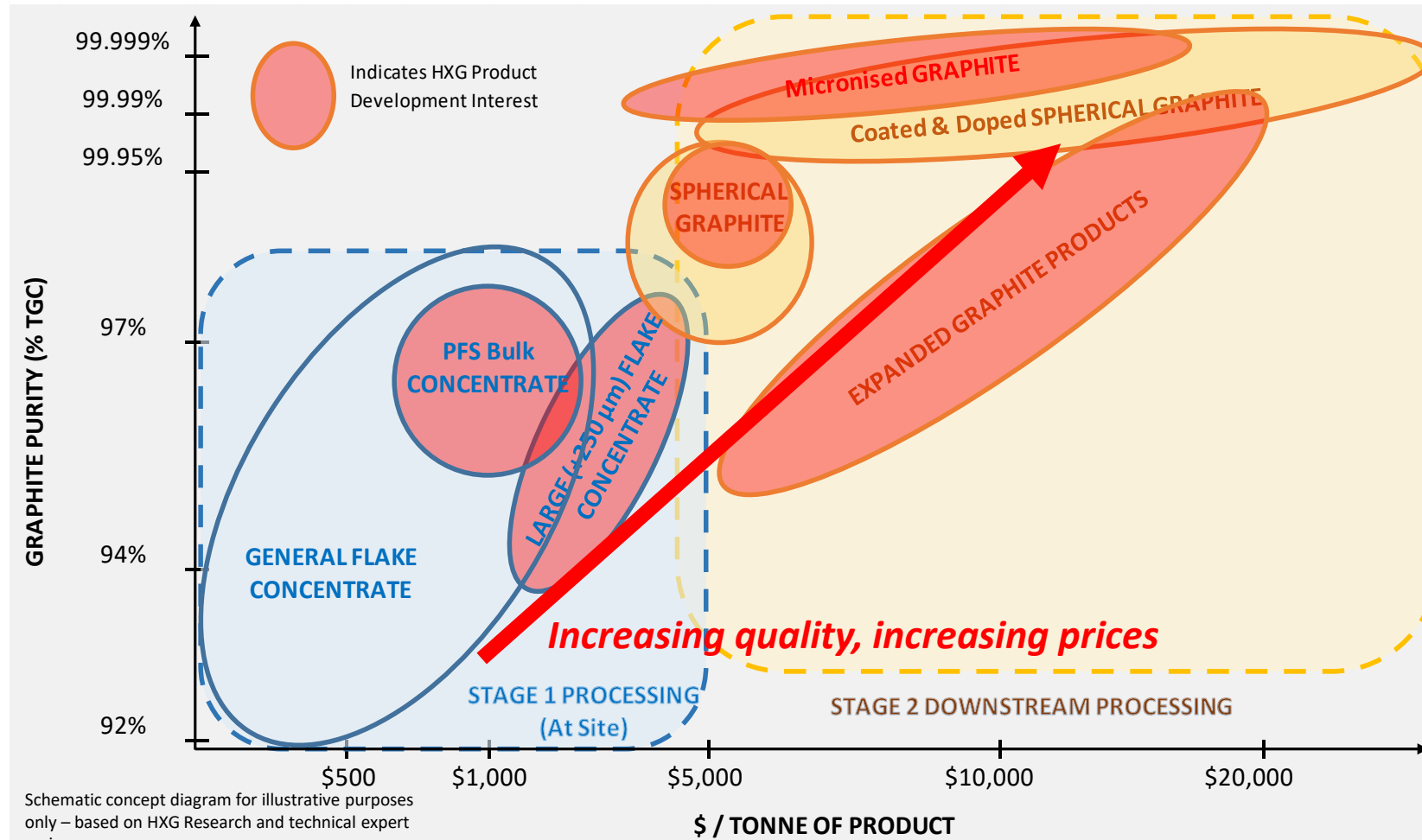


## Key Facts (Cont.)

- Natural flake graphite is already flaky and crystalline; “graphitisation” has already occurred over the course of millions of years under the influence of temperature and pressure in the Earth’s crust.
- Synthetic graphite is expensive but of a consistent quality which is critical for high end applications such as batteries and electrodes – but it is harder and less conductive than natural graphite and does not “expand”.
  - Batteries - 0.4 to 0.5mtpa of graphite goes into batteries
    - Natural graphite comprises between 50 to 30% of the battery – mainly in the anode and;
    - the other 50 to 70% is synthetic graphite
  - Electrodes – 0.75 mtpa of synthetic graphite is used for electrodes e.g. electric arc furnaces (EAF)
  - Currently 30% of the worlds steel is made in EAF and China accounts for 50% of that steel production, but only 7% of steel in China is made by EAF which presents a major growth opportunity as smaller more efficient EAF replace larger scale blast furnaces.
- Demand growth for graphite in batteries and traditional uses such as steel making have strong growth fundamentals.

# Graphite is not a commodity! “Exploration is Product Development”

## Product development – a Map of Opportunities



**Focus is to meet customers' requirements.**

- Primary & Secondary processing (*blue & yellow outlines*)
- Value drivers relate to:
  - ✓ Purity;
  - ✓ Flake size; and
  - ✓ Crystal structure.
- HXG is targeting higher value Primary & Secondary products to exploit its superior purity and flake size.



# McIntosh Graphite™ – key value drivers



## What appeals to customers is.....

Recent test work has demonstrated new opportunities to produce and sell the 100ktpa of flake concentrate planned by diversifying the customer base across a range of end-uses and customers.

### Key attributes include:

- ✓ Purity
- ✓ Flake size
- ✓ Expansion
- ✓ Crystallinity
- ✓ Battery properties
- ✓ Project / supply scale
- ✓ Country of origin



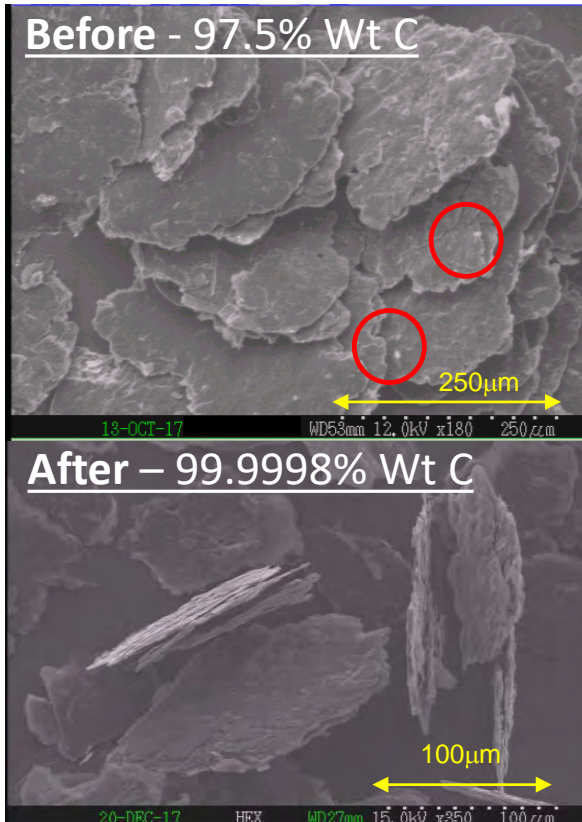


# McIntosh Graphite™ – key value drivers



## Purity – this is the key value driver

High purity, high value, high margin – McIntosh Graphite “easily purified” to 99.999%



Impurities (circled-top) tend to occur on top of the flakes not embedded into the flake layers making for “easier” purification;

Concentrate grades of 99.9998 wt% C and 99.9991 wt% C were achieved by a proprietary medium temperature thermal purification technique.

Purification test results are important for 3 core reasons:

- **Price premium:** *Five Nines* enables HXG to operate in the “nuclear purity world”. Any extra “Nine” elevates the selling price by an order of magnitude. *Five Nines* flake could have a selling price of around US\$30k per tonne.
- **Low cost:** achieving Five Nines (99.999%) from only “light” purification means low costs compared to acid leach or other thermal refining systems currently used, worldwide.
- **Environmental and Safety:** the use of acids, in particular, hazardous hydrofluoric acid is the dominant purification method with resultant adverse impacts on the environment and worker safety.

***“A clean, benign ore-type is a key differentiating factor and outweighs simple mining metrics, such as grade.”***

# McIntosh Graphite™ – key value drivers



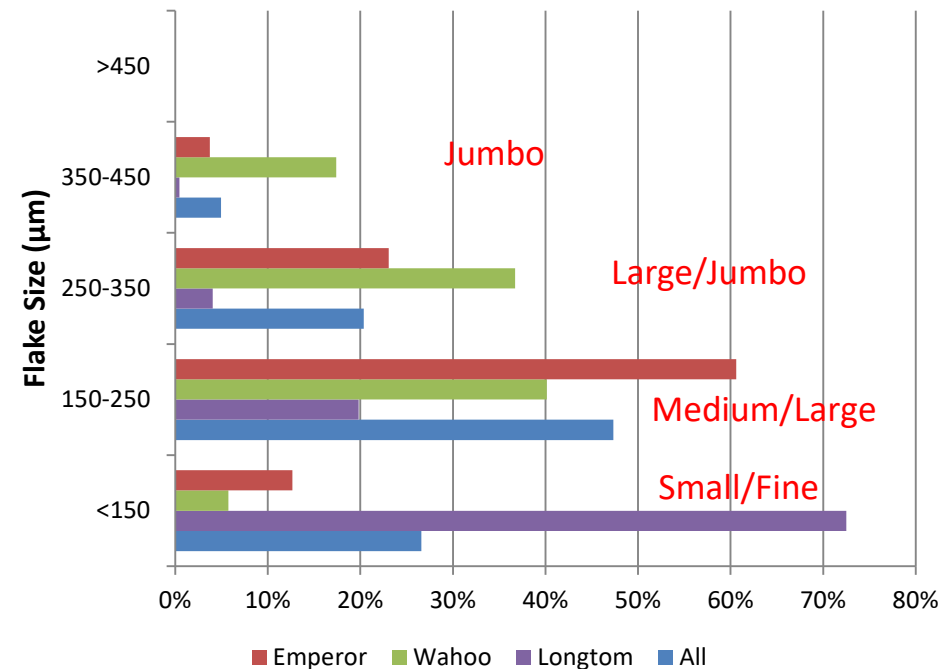
## Flake Size

The McIntosh project has a major large flake endowment – only recently recognised.

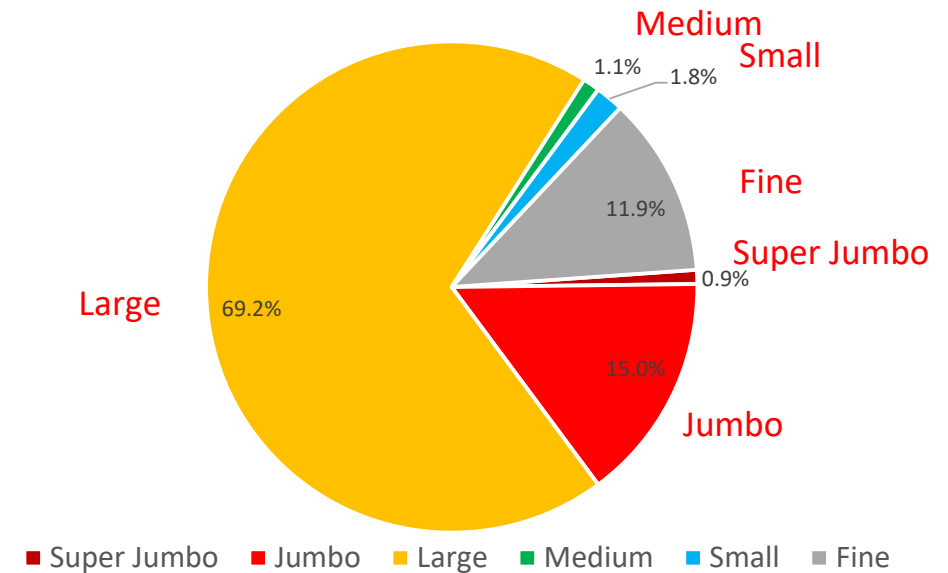
Emperor & Wahoo comprise 70% of the Mineral Resource

85% of Flake in Concentrate sample is Large, Jumbo & Super Jumbo size.

Flake Size Distribution by Deposit



Flake Size Categories - HXGCon1



Based on petrographic examination of flake length from drill core.



USA Sieve Series - ASTM Specification E-11:70 (ISO Standard)

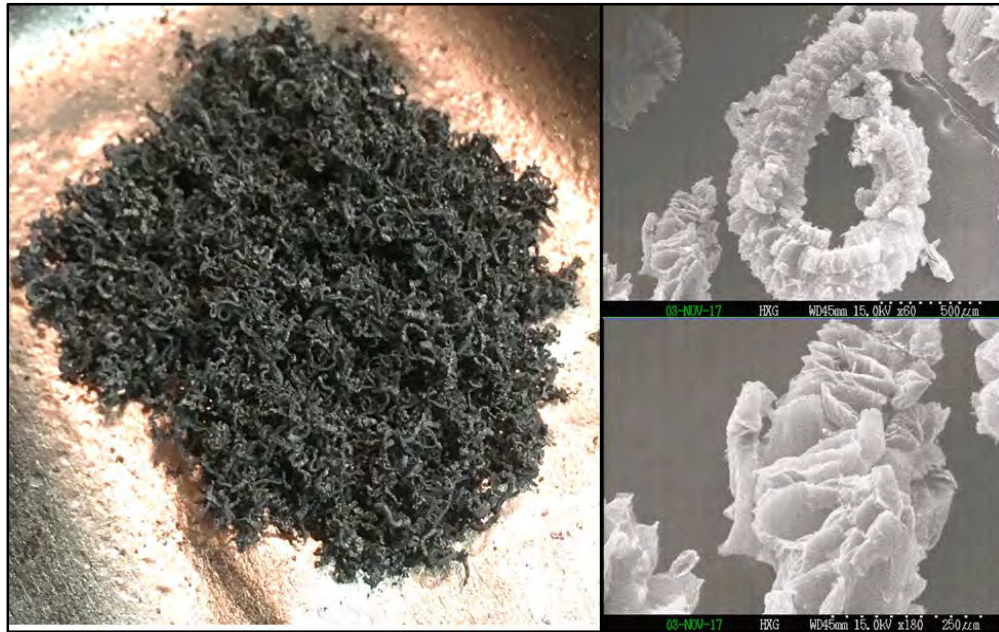
	Fine	Small	Medium	Large	Jumbo	Super Jumbo
Mesh (ASTM)	200	200-100	100- 80	80 - 50	50 - 35	+ 35
Microns	< 75	+75 - 150	+150 - 180	+180 - 300	+300 - 500	+500

# McIntosh Graphite™ – key value drivers



## Expandability

**220% Expansion Factor for +60 Mesh (+250 micron) sized flake.**



Expanded graphite “worms” produced from +60 mesh fraction of HXGCON 1 precursor flake: optical (left), SEM (right).

### Key Points:

Large proportion of the Mineral Resource comprise large, potentially expandable flake ( +78% of concentrate flake was larger than 60 Mesh (250 microns)).

Synthesis of expandable McIntosh flake graphite did not require the use of exotic chemicals or complicated treatments – translates to – Low Costs.

Important growth market due to:

- Declining supply from China; and
- Increased demand as a fire retardant and in electronics.

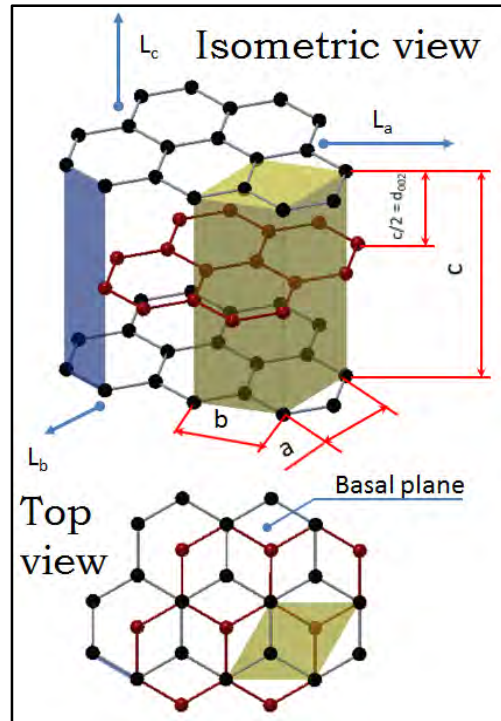
***“A 220% Expansion Factor is well above average and a highly marketable attribute.”***

# McIntosh Graphite™ – key value drivers



## Crystallinity

Highly crystalline, near all-hexagonal preferred crystal orientation – vital aspects to compete with premium quality synthetic graphite products.



Testing undertaken by US Dept. of Energy – provides rare hard data on the exceptional qualities of McIntosh purified flake required by all leading lithium-ion, lead acid and alkaline battery manufacturers.

**Results** – perfect interlayered spacing and large scale (macro) crystal structures.

Source of Technical Data Sheet	Specified Crystalline Lattice Attributes	
	La and Lc (nm)	d <sub>002</sub> interlayer spacing (nm)
McIntosh Sample	>5,500 (La); >1,000 (Lc)	0.3351
TIMREX® KS44	100 (Lc); >100 (La)	0.3354-0.3358
TIMREX® KS15	80 (Lc); > 90 (La)	0.3356
TIMREX® BNB90	35 (Lc)	0.3359

**Customer's perspective?** – McIntosh purified flake has enhanced attributes - higher electrical conductivity, greater reversible capacity towards lithium ion intercalation, superb thermal management properties and better lubricity for ultra-purified material. *This can compete with synthetic graphite on quality and price.*



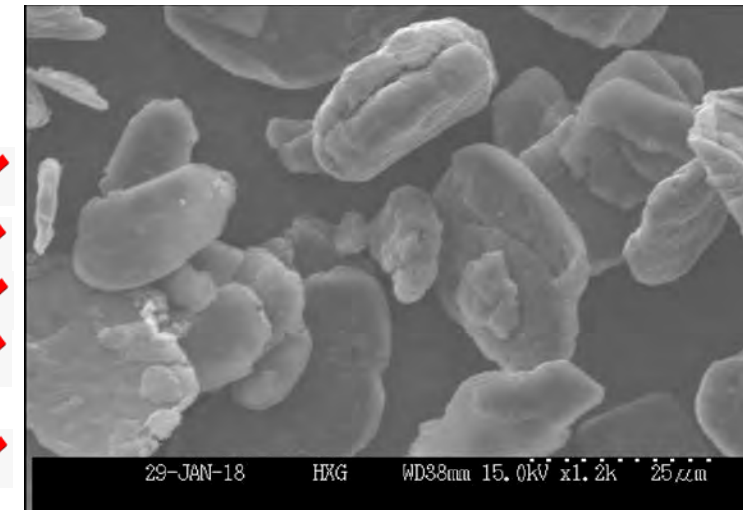
# McIntosh Graphite™ – key value drivers



## Battery properties

- **Recent battery test work** results for spheroidised material are highly encouraging – the sample “passed” on all the key preliminary assessment criteria.

Parameter Tested	Units	McIntosh Sample (average)	Reference Material
Yield	%	58	c.50%
Particle Size (D50)	Microns (µm)	15.3	15.1
Particle Size Distribution (D90/D10)	Ratio	2.2	2.4
Tap Density	g/cm <sup>3</sup>	0.92	1.07
Surface Area	m <sup>2</sup> /g	8.9	2 - 5
Reversible Capacity <sup>2</sup>	mAh/g	370	>360



HXG Spherical graphite suitable for Li-Ion battery anode material.

\*recent work indicates BET Surface Area reducing to between 2 to 4.

- Latest work in the US on concentrate material also highlights positive battery attributes such as “exceptionally low surface area” (BET).
- Suitable for Li-Ion battery anodes and more advanced battery applications.

# McIntosh Graphite™ – key value drivers

## Project Scale

Scale is important – it demonstrates long-term supply capability.

JORC Classification	Tonnes (Mt)	TGC (%)	Contained Graphite (kt)
Total Indicated & Inferred	21.3	4.5%	964

ASX Report 25 May, 2017; Cut-off is 3%TGC and rounding errors may occur.

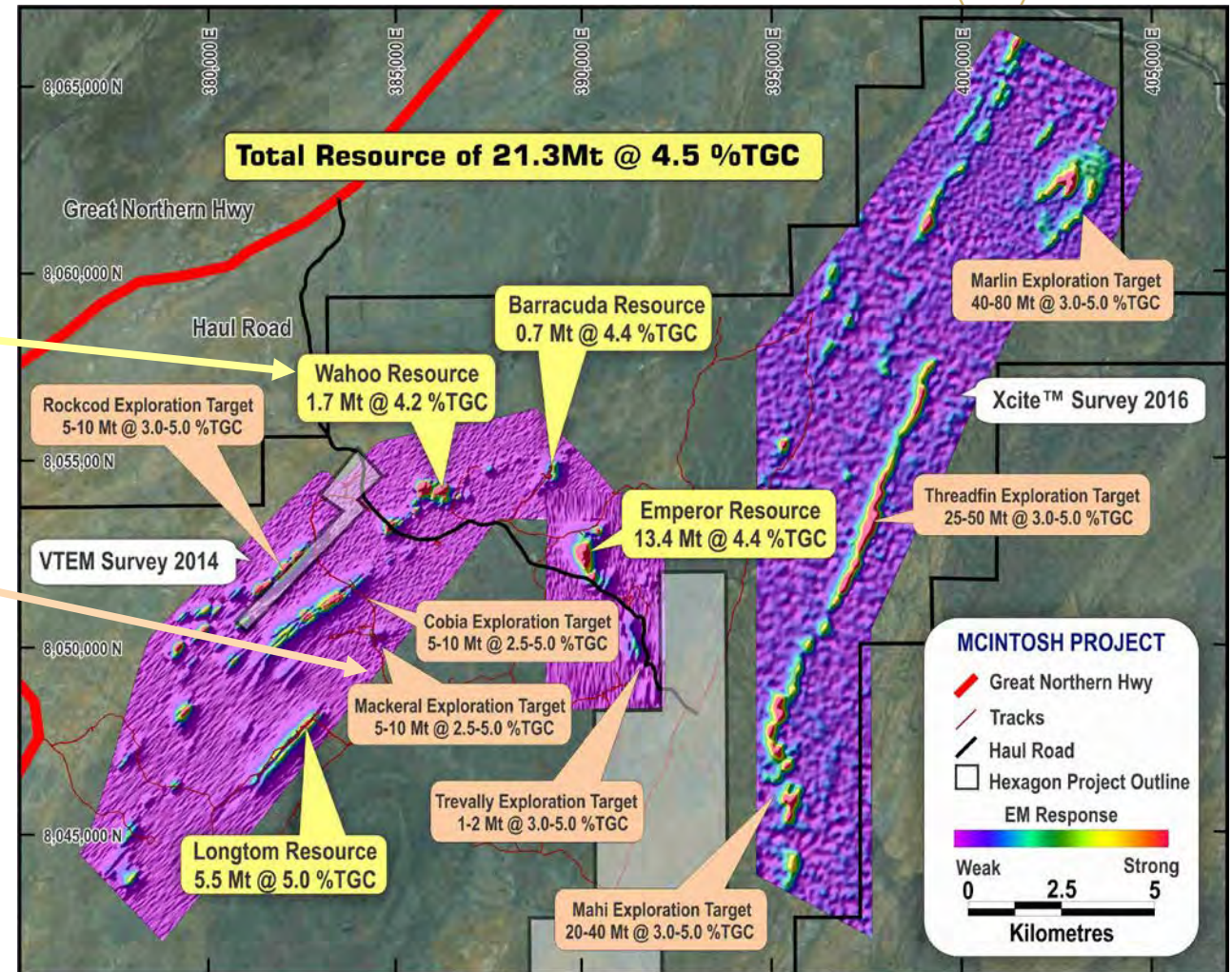
## Exploration Target\* (additional to JORC Resources)

Prospect	Tonnage Range (Mt)	Grade Range TGC (%)
Total	110 - 220	2.5 – 5.0

ASX Report 12 April, 2017

- Excellent correlation between EM “highs” and drilled mineralisation.
- Drilling has excellent potential to increase existing resources and convert “targets” into resources.

**\*Cautionary Statement:** The potential quantity and grade of the Exploration Targets is conceptual in nature, there has been insufficient exploration work to estimate a mineral resource and it is uncertain if further exploration will result in defining a mineral resource.

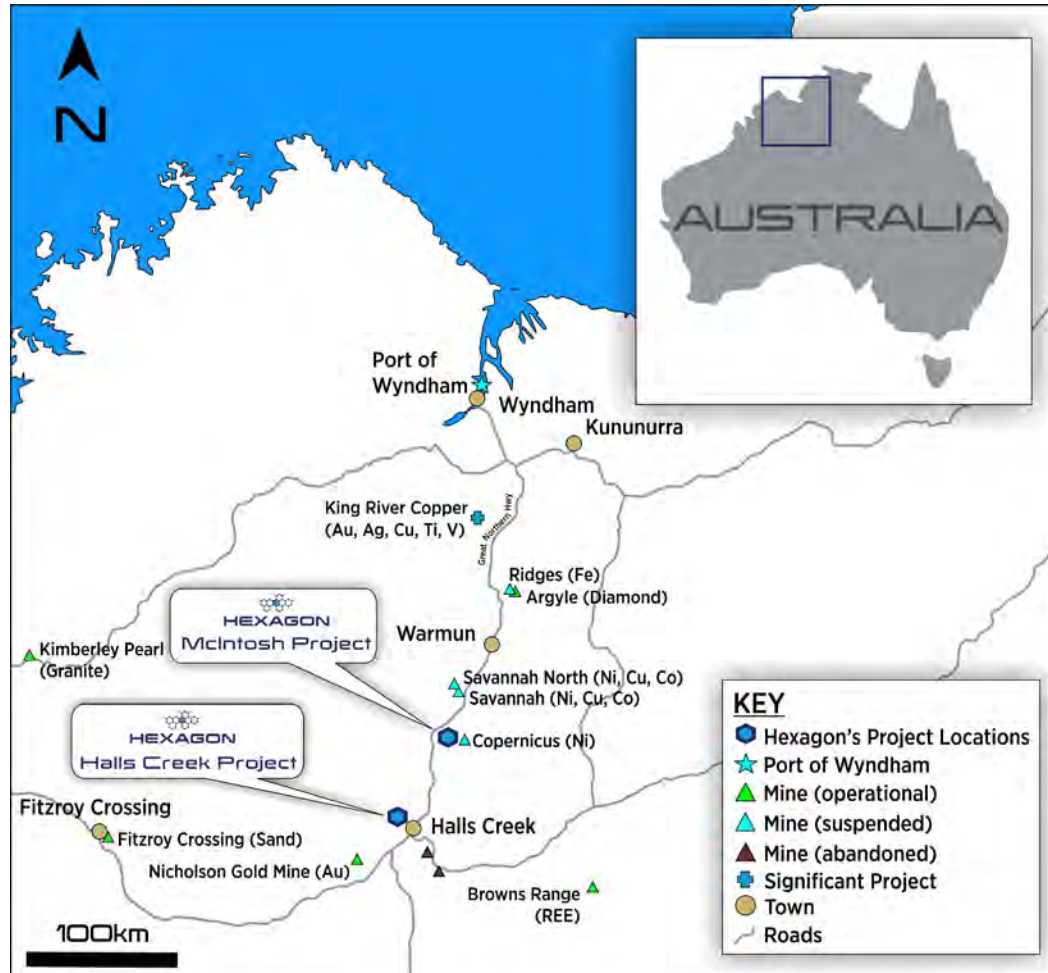




# McIntosh Graphite™ – key value drivers



## Country of Origin



**McIntosh Flake Graphite Project - is well located “politically” & geographically:**

- East Kimberley, WA is an established mining area.
- Project & Port access is well positioned to key customer groups – gateway to Asia and shipping routes to Europe, Middle East and USA.
- Western Australia has an established and stable mining regulatory environment.
- Excellent relationships with all key stakeholders.

**Customers are attracted by “long-term supply” from stable, reputable countries with sound environmental and community relations practices.**



# Project Financing & Development



## Partnered with ASX listed Mineral Resources Limited

- McIntosh Stage 1 feasibility and development funding de-risked.
- ASX listed Mineral Resources Limited (MRL) earn a 51% interest in the McIntosh Project tenements by exploration and development (subject to HXG shareholder approval and positive feasibility study).
- MRL to fund and complete feasibility study and subject to positive feasibility outcome, all Stage 1 development to commercial production – based on 2017 PFS production scenario of 100,000tpa of graphite concentrate
- MRL to operate the Stage 1 project through a life of mine Mining Services Agreement – effectively a “pit to wharf” solution for the McIntosh Project.
- MRL to achieve Commercial Production within a 3-year timeline.
- Marketing rights to be shared 50:50 through a special purpose company.
- Standard operating JV; each party contributes its shares of OpEx and receives its share of Product which will be marketed by the 50:50 joint entity.



***“the joint venture with MRL is a major de-risking event being fully funded to commercial production”***



# McIntosh Flake Graphite Project

Well located for transport infrastructure



McIntosh Project – Main Access Road – excellent access across Project.



Great Northern Highway (only 12 km from Project area)



Wyndham Port – with loading and storage facilities; 295km north along Highway



# McIntosh Flake Graphite Project - what it might look like



Stage 1: Multi open pit mining, simple flotation to produce high-grade graphite concentrate, which is trucked to nearby port.

# McIntosh Flake Graphite Project

**Positive Pre-Feasibility Outcomes; but already superseded by recent test results**



PHYSICALS	Unit	Annual Average	Life of Mine (LOM)
Ore Mined	Mt	2.4	14.3
Strip Ratio	W:O	4.3	4.5
Total Mined	Mt	11.3	79.3
Total Mined	Mbcm	4.1	28.7
Head Grade	% TGC	4.25	4.25
Plant Recovery	%	87-93	93
Concentrate	Kt	82.0	573.7
Concentrate Grade	% TGC	98	98

## PFS – Key Enhancement Opportunities for FS:

- Higher pricing from new and higher quality graphite products as shown by recent test work.
- Lower operating costs from improved process flow sheet, lower energy comminution and possible Ore Sorting or beneficiation.
- Lower capital costs from use of specific rather than generic quotes, second-hand equipment and benefits of ore-sorting and other plant optimisations.

PFS FINANCIAL OUTCOMES	Unit	Life of Mine (LOM)
Site Operating Costs	AUD/t Conc	987
Realisation Costs (FOB)	AUD/t Conc	51
Total Operating Costs	AUD/t Conc	1,038
Start-up Capital (Incl 15% Contingency)	AUD Millions	148
Sustaining Capital	AUD Millions	24.9
Revenue	AUD Millions	1,197
Revenue	AUD/t Conc	2,087
EBITDA	AUD Millions	654
EBITDA Margin	%	51
<b>Pre-tax NPV (Discount rate:8%)</b>	AUD Millions	<b>261</b>
Post-tax NPV (Discount rate:8%)	AUD Millions	175
<b>Pre-tax IRR</b>	%	<b>46</b>
Post-tax IRR	%	36
Payback Period	Years	3

***“This PFS (May 2017) has been superseded by recent positive test work results, but it remains a valid, conservative platform to move ahead from on the detailed Feasibility.”***



# Marketing Strategy



## Guiding principles

### **Target market – premium higher purity products;**

- McIntosh project's unique, clean ore-type generates high-purity intermediate and final flake graphite products covering a range of end uses, which sell at premium prices.

### **How? A 50:50 marketing partnership with Mineral Resources aimed at:**

- 1. Supplying increasing demand for graphite in battery and technology applications;**
  - Rapid growth market and underpinned by ongoing solid demand in industrial sectors.
- 2. Facilitate displacement of higher cost synthetic graphite from a range of current applications across the battery sector and steel industry;**
  - Refined McIntosh graphite exceeds synthetic purity levels and often has enhanced “side” attributes e.g. can be more conductive.

***Demand growth, product diversity, including displacement of synthetic by high purity McIntosh graphite is the means to sell c.100ktpa.***



# Marketing Strategy

**Product development** - “looking at the **Stage 1 Concentrate** through the customer’s eyes”



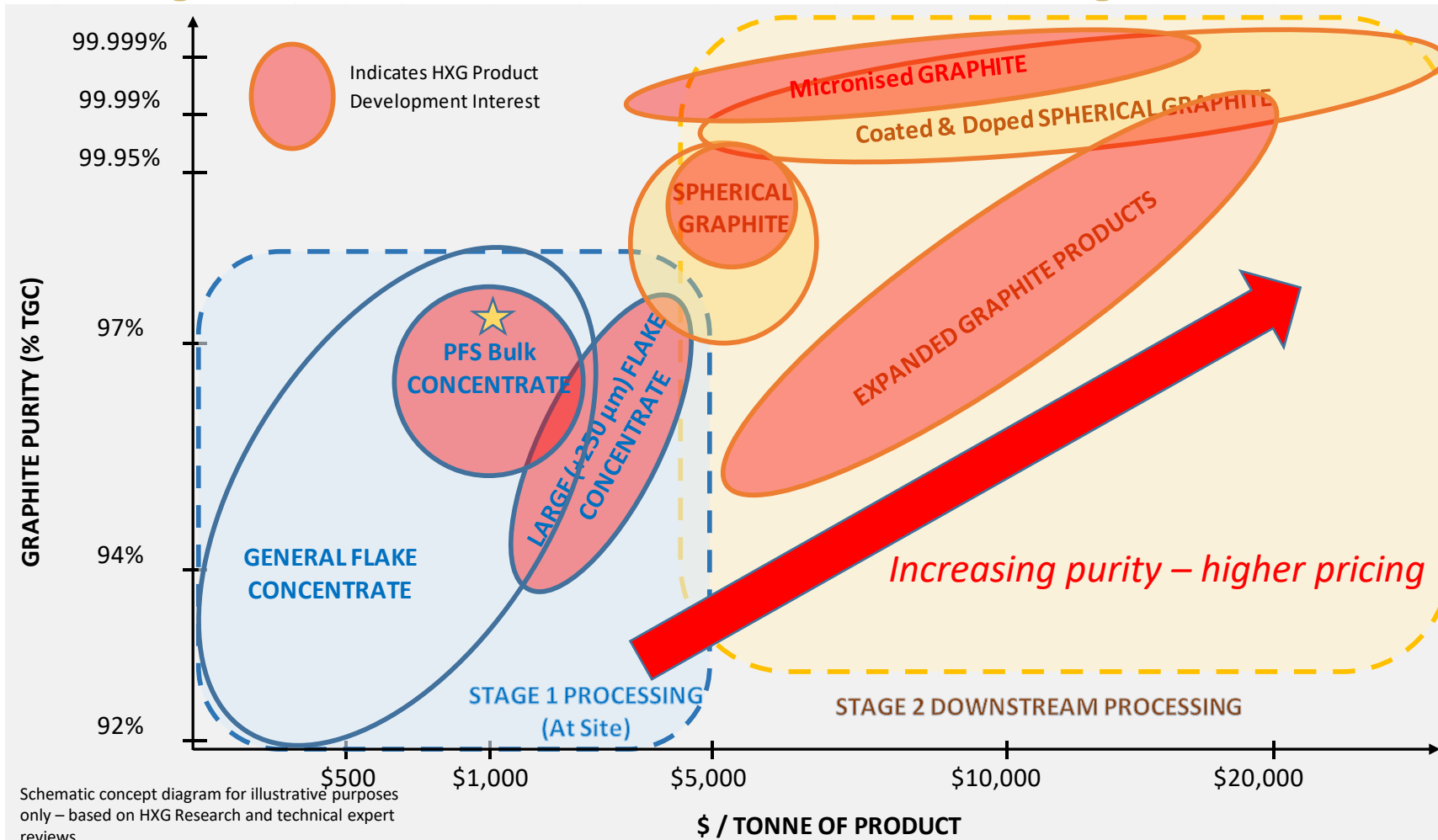
**Downstream = additional “value-add” processing to meet the customers’ needs**

Downstream Process Being Tested	Potential End Uses
Milling (Micronising) & Spheroidisation	Li-Ion battery anode material Some speciality battery applications
Expanded / Expandable Graphite	Advanced battery applications Foils and shielding in electrical goods Fire retardant in building materials High-specification gaskets and seals
Purification	Many end uses require high to ultra high purity graphite – this includes battery anode and expandable graphite material. The 5-Nines purity elevates product into the nuclear industry with major price increments.

**This is highly simplified, but reflects recent test work results which have lead to new, higher margin end-use opportunities to be assessed.**

# Marketing Strategy

## Marketing Plan for McIntosh Products – HXG:MinRes Target Markets



**Originally:** planned to produce a single Bulk Concentrate as per May 2017 PFS. ★

**Now:** a portfolio of products which is the key to selling 100kt concentrate per year:

- Large flake & expandability drives diversification.
- High-purity is a means to achieve premium pricing.
- McIntosh material “starts” clean so a big comparative advantage cost wise.

***“New marketing strategy comprises more products sold at premium prices.”***

# Marketing Strategy

## Product diversification and price enhancement

### A simple example -

**Objective** – produce c. 100ktpa of high grade flake graphite concentrates:

- If 60% is Large (>180 microns) sized flake concentrate for expandable graphite sector (*a premium priced product*); and
- If 40 % is Small-Medium (c.100 microns) sized flake concentrate for the battery market.

**Then assume** – conservatively, Opex of US\$800\*/t concentrate. So to produce 10 tonnes costs US\$8k.

### Marketing – (very simplistically):

- Sell 6 tonnes as a premium product at say c.US\$3,000/t = US\$18k of revenue
- Sell 4 tonnes as “standard” LiB anode use for say c.US\$800/t = US\$3.2k of revenue
- Generated US\$21.2k in revenue to cover US\$8k of Operating costs = US\$13.2k margin or 62% operating margin.

\* Assume 1 A\$=US\$0.8



Pilot Plant Facility – bulk concentrate sample



# Looking ahead

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## Next steps.

- ✓ HXG Shareholder approval for the Mineral Resources JV – planned early May, 2018.
- ✓ Undertake formal documentation of the Mineral Resources JV – in progress.
- ✓ Plan transition for MRL to takeover project management of McIntosh – but with ongoing input from Hexagon technical team planned.
- ✓ Chief Development Officer appointed and to commence Mid-May as HXG employee; highly qualified, graphite and specialty metal technical expert to contribute on McIntosh-Stage 1 and oversee Stage 2 technical implementation.
- ✓ Ongoing Stage 2 graphite test work and pilot plant development for thermal purification.
- ✓ Halls Creek Project – highly prospective, early stage gold and base metal project in an emerging highly mineralised belt; regional geophysics and drilling planned.
- ✓ Ongoing assessment of new, high-quality “specialty or advanced materials” projects.

# Hexagon Resources Ltd



## Meet the Board - focussed on marketing and production

### Charles Whitfield – Chairman, contributes:

- Debt and ECM experience via senior roles with a range of international investment banks;
- Deep insight on specialty metals markets specifically lithium as executive Director of Galaxy Resources for 3 years to late 2016 guiding the turn-around; and
- Strong commercial and offtake / product marketing skills.

### Mike Rosenstreich - Managing Director, contributes:

- Strong technical, project development and operational skills across a wide range of commodities and mining/processing styles;
- Highly experienced in a range of commodity markets and underlying offtake arrangements as well as project financing following 6 years with Rothschild's resource finance group; and
- Corporate management having floated and run a base metals production company with staff of 150, turn-over +\$100mpa as well as several other ASX listed/private Company directorships.

### Garry Plowright - Non-Executive Director, contributes:

- Strong background in mining law and administration;
- Relevant experience in land access strategies and negotiations in Western Australia with native Title and Traditional Owner groups for major development projects; and
- International experience in mine development.



**Board of Directors:** (from Left); M. Rosenstreich, Charles Whitfield, Garry Plowright and Rowan Caren (Company Secretary)

Shares on Issue	251.2M
Options on issue (unlisted)	29.4M
Share price (29/3/18)	A\$0.265
12 Month high/low	A\$0.28/A\$0.08
Market Capitalisation	A\$67M
Top Twenty	44%
Cash (31/12/17)	A\$1.1M



# Highlights



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# Important Notices

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## **Competent Persons' Attributions**

### ***Exploration Results and Mineral Resource Estimates***

The information within this report that relates to exploration results, Exploration Target estimates, geological data and Mineral Resources at the McIntosh Project is based on information compiled by Mr Shane Tomlinson and Mr Mike Rosenstreich who are both employees of the Company. Mr Rosenstreich is a Fellow of The Australasian Institute of Mining and Metallurgy and Mr Tomlinson is a Member of the Australian Institute of Geoscientists. They both, individually have sufficient experience relevant to the styles of mineralisation and types of deposits under consideration and to the activities currently being undertaken to qualify as a Competent Person(s) as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves and they consent to the inclusion of this information in the form and context in which it appears in this report.

### ***Metallurgical Test Work Outcomes***

The information within this report that relates to metallurgical test work outcomes and processing of the McIntosh material is based on information provided by a series of independent laboratories. Mr Rosenstreich (referred to above) managed and compiled the test work outcomes reported in this announcement. A highly qualified and experienced researcher at NAMlabs planned, supervised and interpreted the results of the test work. The NAMlabs principals have sufficient experience relevant to the styles of mineralisation and types of test work under consideration and to the activities currently being undertaken to qualify as a Competent Person(s) as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves and have consented to the inclusion of this information in the form and context in which it appears in this report.

### ***Technical Detail - references to Hexagon Website and recent ASX Reports***

This Report aims to provide a high level summary of various technical aspects of the Company's projects. For more details on the underlying technical parameters the reader is referred to the ASX Reports on the Hexagon Resources Limited website, [www.hexagonresources.com](http://www.hexagonresources.com), in particular: May 31, 2017 on PFS Results, August 16, 2017 on Battery Test Work, November 6, 2017 on Large Flake endowment, November 23, 2017 on Expandability test work, Purification test work on January 16, 2018 and Crystallinity determinations on March 6, 2018; all of which contain the full JORC Tables on reporting of test work results.

### ***Forward-Looking Statements***

This document includes forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Hexagon Resources Limited's planned development and exploration programmes and other statements that are not historical facts. When used in this document, the words such as "could," "plan," "estimate," "expect," "intend," "may," "potential," "should," and similar expressions are forward-looking statements. Although Hexagon Resources Ltd believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward-looking statements.



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