



## **DFS CONFIRMS CHILALO AS HIGH MARGIN GRAPHITE PROJECT**

Corporate Presentation - January 2020





# DISCLAIMER

This presentation (the “Presentation”) has been prepared by Graphex Mining Limited (“Graphex”). No party other than Graphex has authorised or caused the issue of this document, or takes responsibility for, or makes any statements, representations or undertakings in this Presentation. This Presentation does not constitute an offer, invitation or recommendation to subscribe for or purchase any securities and neither this Presentation nor anything contained in it shall form the basis of any contract or commitment.

This Presentation contains summary information about Graphex and its activities, which is current as at the date of this Presentation. The information in this Presentation is of a general nature and does not purport to be complete nor does it contain all the information which a prospective investor may require in evaluating a possible investment in Graphex that would be required in a prospectus or product disclosure statement prepared in accordance with the requirements of the Corporations Act 2001 (Cth). This Presentation should be read in conjunction with Graphex's other disclosures and announcements lodged with the ASX, which are available at [www.asx.com.au](http://www.asx.com.au).

This Presentation is not a prospectus, product disclosure statement or other offering document under Australian law (and will not be lodged with the Australian Securities and Investment Commission) or any other law.

This presentation includes certain “forward-looking statements”. Forward-looking statements and forward-looking information are frequently characterised by words such as “plan,” “expect,” “project,” “intend,” “believe,” “anticipate”, “estimate” and other similar words, or statements that certain events or conditions “may”, “will” or “could” occur. All statements other than statements of historical fact included in this presentation are forward-looking statements or constitute forward-looking information. Although the Company believes the expectations expressed in such statements and information are based on reasonable assumptions, there can be no assurance that such information or statements will prove to be accurate and actual results and future events could differ materially from those anticipated in such information. Important factors that could cause actual results to differ materially from those in forward-looking statements include the market price of graphite, exploitation and exploration successes, capital and operating costs, changes in project parameters as plans continue to be evaluated, continued availability of capital and financing and general economic, market or business conditions, as well as those factors disclosed in the Company's filed documents. Accordingly, readers should not place undue reliance on “forward looking information”. There can be no assurance that a transaction for offtake and finance will be concluded, or that development of the Chilalo Graphite Project will proceed as planned or that the resources at Chilalo can be economically exploited.

This Presentation has been prepared in good faith, but no representation or warranty, express or implied, is made as to the fairness, accuracy, completeness, correctness, reliability or adequacy of any statements, estimates, opinions or other information, or to the reasonableness of any assumption or other statement, contained in the Presentation (any of which

may change without notice). To the maximum extent permitted by law, Graphex and its professional advisers and their related bodies corporate, affiliates and each of their respective directors, officers, partners, employees, advisers and agents and any other person involved in the preparation of the Presentation disclaim all liability and responsibility (including, without limitation, any liability arising from fault or negligence) for any direct or indirect loss or damage which may arise or be suffered through use of or reliance on anything contained in, or omitted from, this Presentation.

## Mineral Resources

The information in this Presentation that relates to in situ Mineral Resources for the Chilalo Project was announced on 28 August 2018. Graphex confirms that it is not aware of any new information or data that materially affects the information included in the announcement of 28 August 2018 and that all material assumptions and technical parameters underpinning the estimates in the announcement of 28 August 2018 continue to apply and have not materially changed.

## Ore Reserves

The information in this Presentation that relates to the Ore Reserve at the Chilalo Project was announced on 29 January 2020. Graphex confirms that it is not aware of any new information or data that materially affects the information included in the announcement of 29 January 2020 and that all material assumptions and technical parameters underpinning the estimates in the announcement of 29 January 2020 continue to apply and have not materially changed.

## Forecast financial information

The forecast financial information (and the production target on which such forecast financial information is based) in this Presentation was announced on 29 January 2020. All material assumptions underpinning the forecast financial information (and the production target on which such forecast financial information is based) in the announcement of 29 January 2020 continue to apply and have not materially changed.

## Exploration Results

The information in this announcement that relates to exploration results was announced on 2 September 2015. Graphex confirms that it is not aware of any new information or data that materially affects the information included in the announcement of 2 September 2015.

# POISED FOR PRODUCTION

Completion of DFS clears another funding hurdle

- Robust DFS confirms strong economics that improve during product qualification
- Graphex well-placed to realise enhanced margins as a vertically integrated manufacturer of high-value graphite products
- Unique and market-leading product quality
- Graphex's market strategy & IP provide the platform to capitalise on Chilalo's product quality
- Coarse flake graphite market primed for new entrants
- Poised to become Tanzania's first commercial graphite project – permitted for construction with financier conducting due diligence

# CHILALO PROJECT

High-grade, coarse flake deposit

## WORLD-CLASS LOCATION

South-east Tanzania is the global region for coarse flake graphite

## DFS COMPLETED

significant condition to unlocking senior funding package

## 20.1MT GRAPHITE @ 9.9% TGC<sup>1</sup>

Ore Reserve of 9.2Mt underpins 18 year mine life

## STRONG GRAPHITE MARGIN

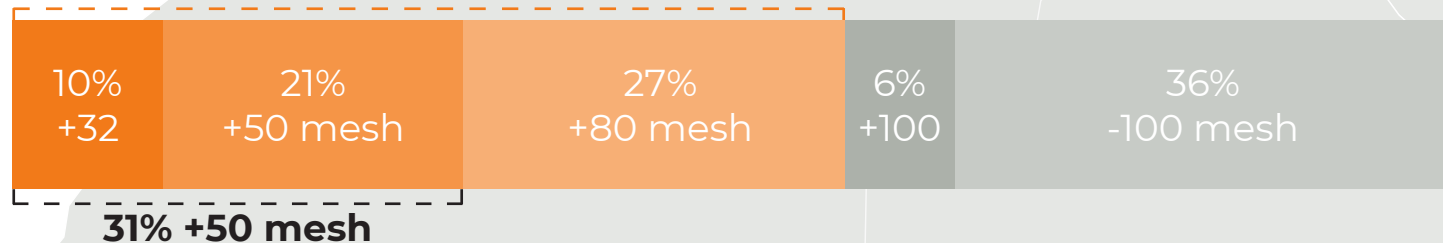
larger flake sizes attract premium prices

## FULLY PERMITTED FOR 2020 CONSTRUCTION

with Mining Licence and Environmental Approvals

### GPX PRODUCT FLAKE SIZE

#### FLAKE SIZE PRICE PREMIUM



<sup>1</sup>. ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”





# DFS ECONOMIC OUTCOMES

Strong economics to a bankable standard<sup>1</sup>

Physicals	Unit	Life of mine
Mine life	years	18
Total plant feed	Mt	8.9
Annual plant feed	ktpa	500
Average head grade	% TGC	10.1%
Average graphite concentrate production <sup>2</sup>	ktpa	50
Steady state expandable graphite sales	ktpa	12
Steady state micronised graphite sales	ktpa	8

Project Financials	Unit	Life of Mine
NPV <sub>8</sub> (Post-tax)	US\$M	331
IRR (Post-tax)	%	36%
Post-tax payback period	years	3.5
Pre-production capital cost (incl. 10% contingency and pre-strip)	US\$M	87.4
Average annual EBITDA	US\$M	74

Product Segment Financials	Unit	Concentrate Graphite	Expandable Graphite	Micronised Graphite	Consolidated production <sup>4</sup>
Average sales price (FOB)	US\$/t	1,534	5,690	2,802	2,500
CI operating costs per tonne (FOB) <sup>3</sup>	US\$/t	778	512	383	905
Operating margin	US\$/t	756	5,178	2,419	1,595

1.ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”

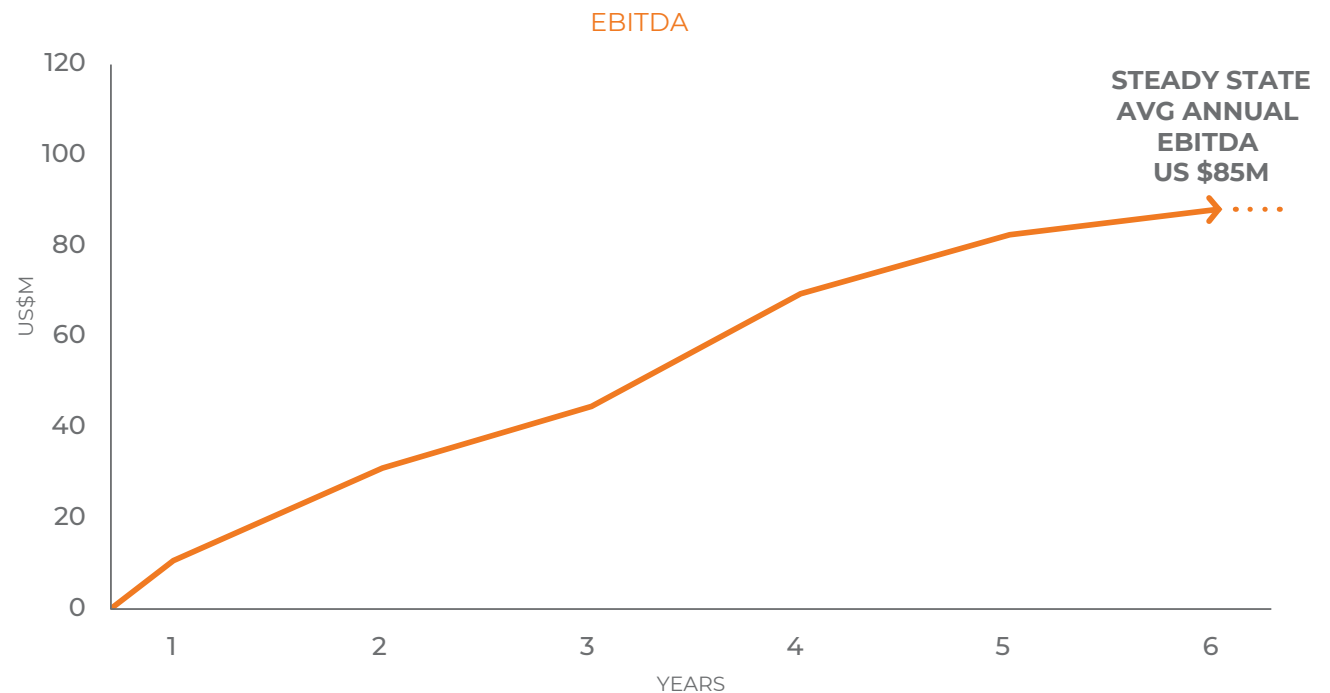
2.Average graphite concentrate production includes graphite concentrate used as feedstock into both value-added products.

3.Operating costs of expandable graphite and micronised graphite excludes the internal transfer price (purchasing feedstock from Chilalo).

4.Consolidated Production shows the average sales price, operating costs and margin for the consolidated operation (ie. Inclusive of concentrate, expandable graphite and micronised graphite).

NPV<sub>8</sub> (POST-TAX)  
**US\$ 331M**

IRR (POST-TAX)  
**36%**



# VERTICALLY INTEGRATED MANUFACTURER OF HIGH-VALUE GRAPHITE PRODUCTS

NOT JUST A MINING COMPANY

PRODUCT (000's)	FLAKE GRAPHITE CONCENTRATE	FEEDSTOCK TO MICRONISED GRAPHITE	FEEDSTOCK TO EXPANDABLE GRAPHITE	ADDITIONS TO INVENTORY	TOTAL PRODUCTION
YEAR 1	43	-	-	3	46
YEAR 2	56	1	-	2	59
YEAR 3	50	2	3	-	55
YEAR 4	48	3	6	-	57
YEAR 5	45	5	9	-	59
YEAR 6	39	6	12	-	57
YEAR 7	28	8	12	-	48

YEAR 1

CONCENTRATE SALES COMMENCE

CONCENTRATE CUSTOMERS

CHILALO MINE (PRODUCING CONCENTRATE ONLY)

YEAR 2

MICRONISED SALES COMMENCE

FIRE RETARDANT COMPANIES (EG CUSTOMERS)

MICRONISED & EXPANDABLE GRAPHITE CUSTOMERS

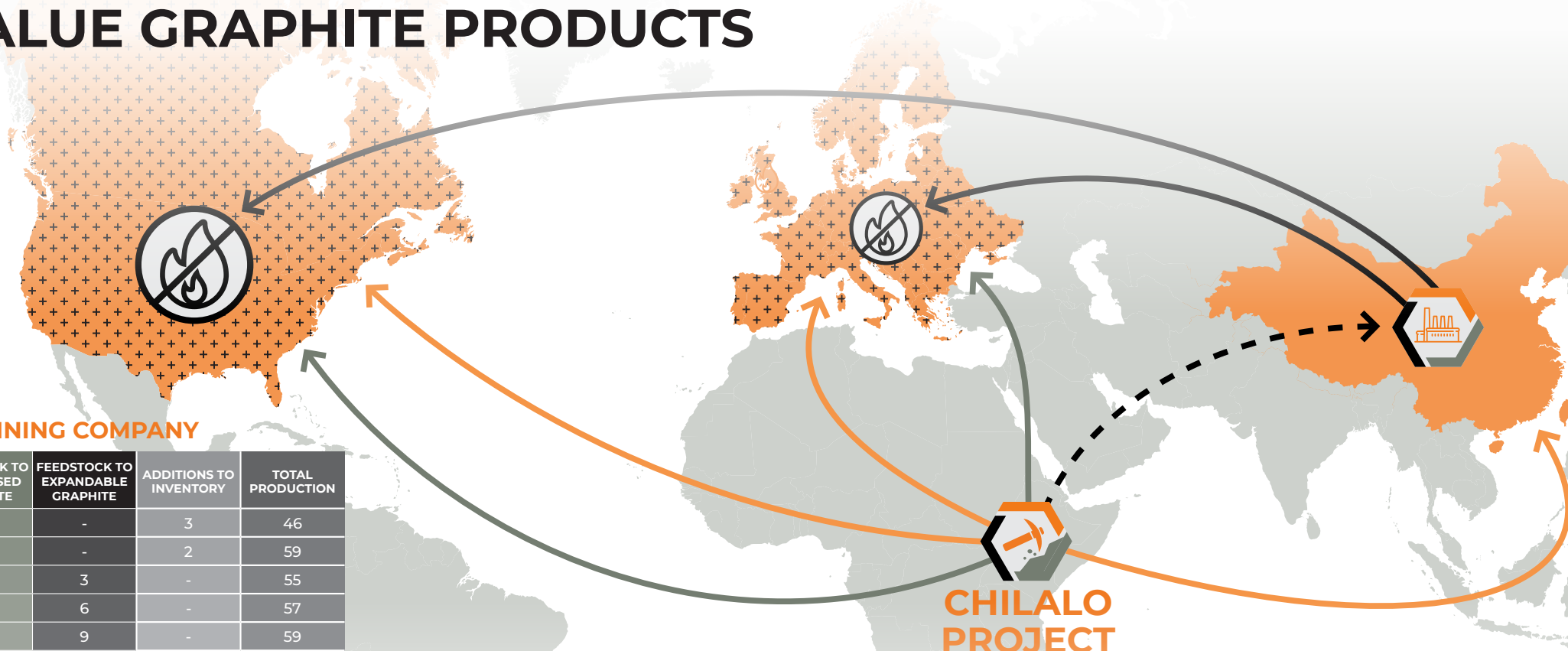
CHILALO MINE (CONCENTRATE & MICRONISED)

YEAR 3

EXPANDABLE GRAPHITE (EG) SALES

EXPANDABLE GRAPHITE FEEDSTOCK

GRAPHEX PROCESSING AGENT





# GRAPHITE CONCENTRATE MARKETING STRATEGY

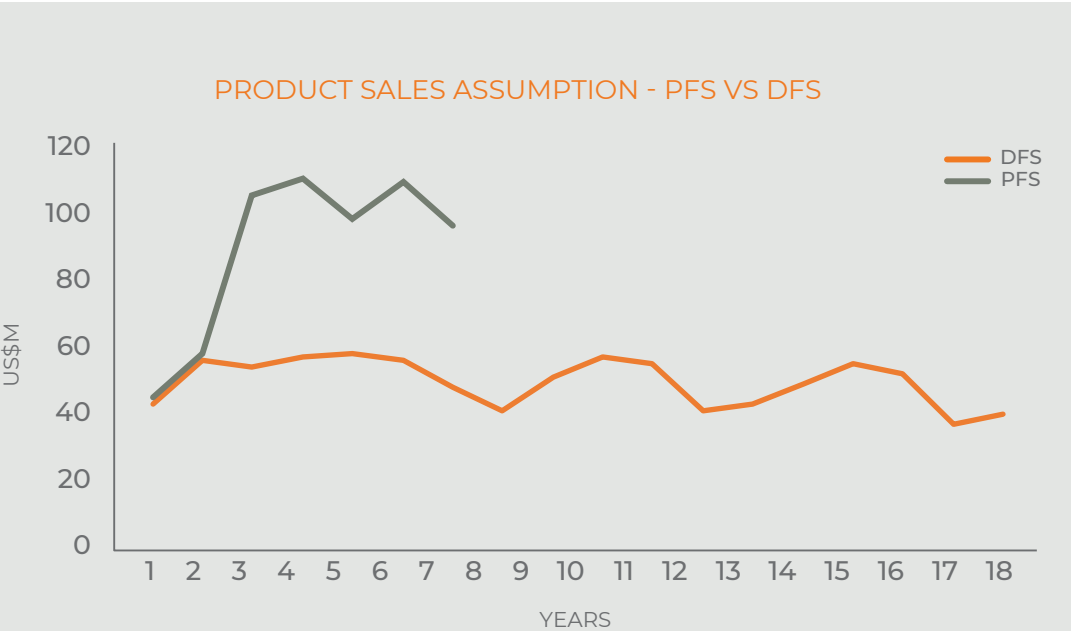
Multi-faceted strategy focused on maximising revenue

## GEOGRAPHICAL DIVERSIFICATION

enhanced focus on Europe, USA and Japan complementing strong historical Chinese focus

## APPLICATION DIVERSIFICATION

seeking exposure to several high-value markets and specifically avoiding low-value markets with limited qualification requirements (eg. refractories)



## FLAKE VS VALUE-ADD

pursuing a low-risk, low capital-intensive strategy to diversify risk and maximise margins

## EXPANSION STRATEGY

production expansion remains a compelling upside opportunity however DFS has excluded an expansion

## SALES AGREEMENTS

numerous potential customers with final sales strategy to constitute part of the final investment decision, to be made in consultation with finance partners

## OTHER STRATEGIES

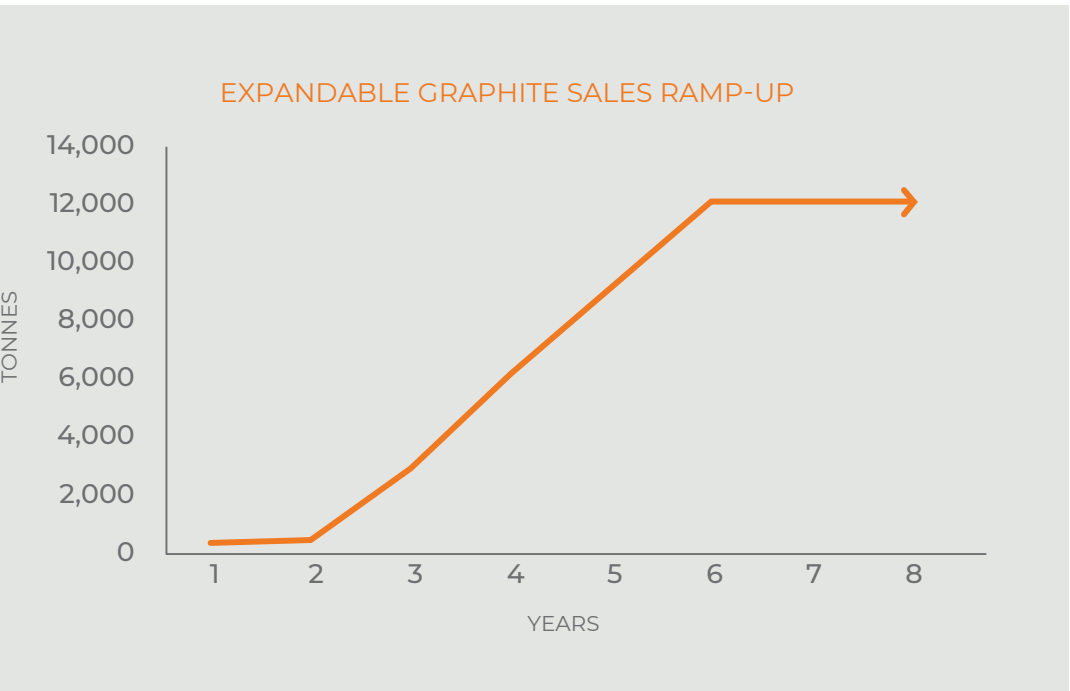
ISO certification, flexibility of packaging options, flexibility of product screening, branding

Product Segment Financials <sup>1</sup>	Unit	Concentrate
LOM Average sales price (FOB)	US\$/t	1,534
C1 operating costs per tonne (FOB)	US\$/t	778
Operating margin	US\$/t	756

1. ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”

# EXPANDABLE GRAPHITE STRATEGY - 4 YEARS IN THE MAKING

Term sheet with world’s largest expandable graphite manufacturer demonstrates Chilalo credentials



FINAL PRODUCT

This block shows two final product categories. On the left, **Fire Retardant Customers** are represented by images of 'Fire Cement 1200' and 'FIRE CEMENT 1300' tubes. On the right, **Foil, Gaskets, Seals Customers** are represented by an image of a roll of foil.

FINAL PRODUCT

This block shows three final product categories. On the left, **Ceramics Customers** are represented by an image of a hexagonal ceramic tile. In the middle, **Alkaline Battery Mfg.** is represented by images of Duracell batteries. On the right, **Plastics & Polymers** are represented by images of various plastic components.

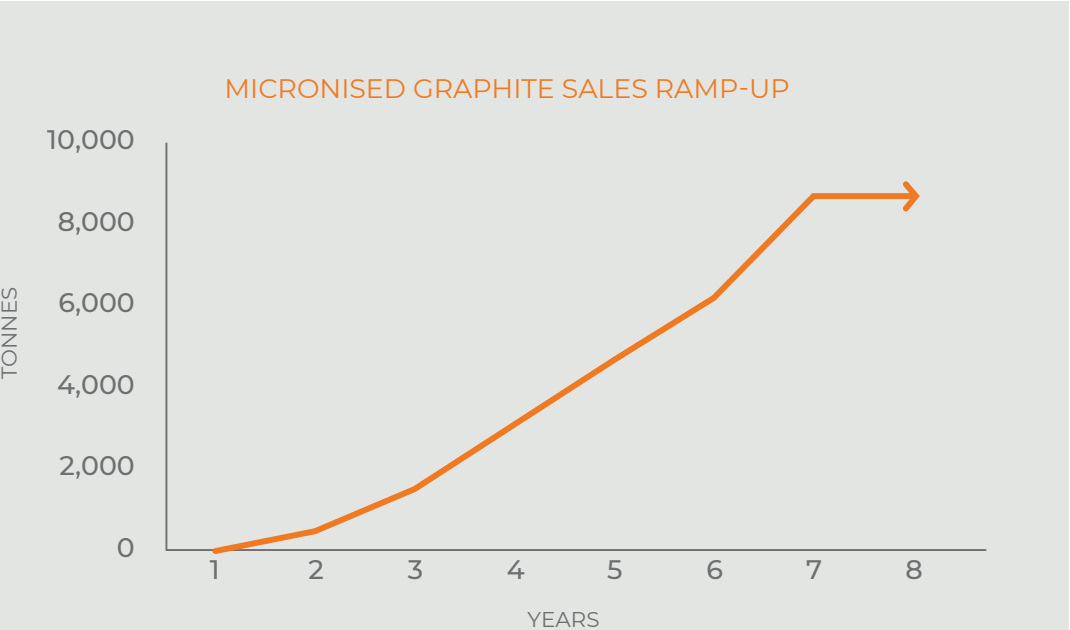
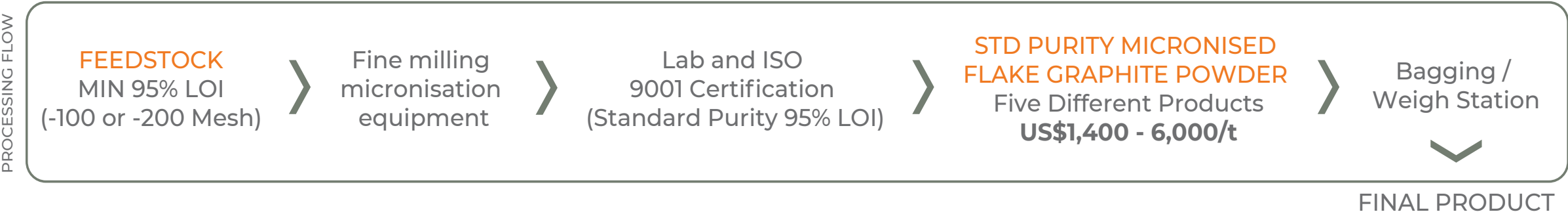
Product Segment Financials <sup>1</sup>	Unit	Expandable Graphite
Capital Cost	US\$M	0
Average sales price (FOB)	US\$/t	5,690
C1 operating costs per tonne (FOB) <sup>1</sup>	US\$/t	512
Operating margin	US\$/t	5,178

1. ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”  
2 Operating costs exclude the internal transfer price (purchasing flake graphite feedstock from Chilalo mine).



# MICRONISED GRAPHITE STRATEGY

Enhancing margins from lower value fines



## STANDARD PURITY MICRONISED GRAPHITE POWDER PRODUCTS

Product Segment Financials <sup>1</sup>	Unit	Micronised Graphite
Capital Cost	US\$M	2
Average sales price (FOB)	US\$/t	2,802
C1 operating costs per tonne (FOB) <sup>2</sup>	US\$/t	383
Operating margin	US\$/t	2,419

1. ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”

2. Operating costs exclude the internal transfer price (purchasing flake graphite feedstock from Chilalo mine).

# POISED TO DELIVER ON GRAPHITE STRATEGIES

Key boxes have been ticked

	Graphite Concentrate	Expandable Graphite	Micronised Graphite
Suitability	DFS testwork, downstream analytical tests performed by independent labs and potential customers	Several independent labs confirm suitability for foils and fire-retardants	Suitability confirmed by micronisation equipment supplier
Marketing	Numerous concentrate customers diversified by application and location	Numerous international fire-retardant companies identified including technical specs required by each	Numerous international micronised graphite customers identified including technical specs required by each
Technical Risk	Pilot plant testwork confirms scale-up to commercial scale operation	Expandable graphite processing term sheet signed with China's largest expandable graphite manufacturer – leveraging off existing technology and processing expertise	Micronisation equipment supplier is a respected supplier to the industry
Economics	Strong economics driven by product quality (average sales price) – upside opportunities to reduce operating costs	Substantial value-add with no capital investment	Very low capital cost and substantial value-add (low-value -100 mesh feedstock)
Timing	Construction subject to funding	Sales commence in year 3 following ~24 months qualification timeframe and progressive sales ramp-up	Micronisation equipment installed in year 2 with progressive sales ramp-up

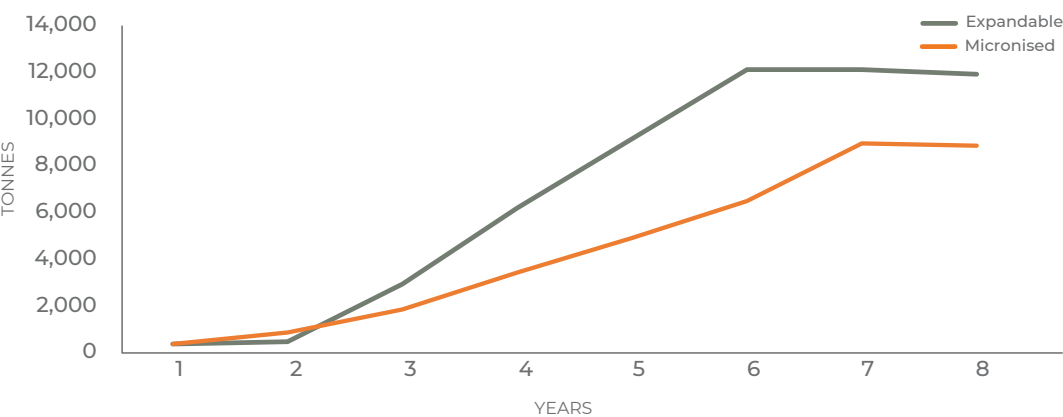


# IMPROVING ECONOMICS OF THE CHILALO PROJECT

Product qualifications drive six years of increasing EBITDA<sup>1</sup>

## DRIVERS

VALUE-ADDED PRODUCTS SALES RAMP-UP

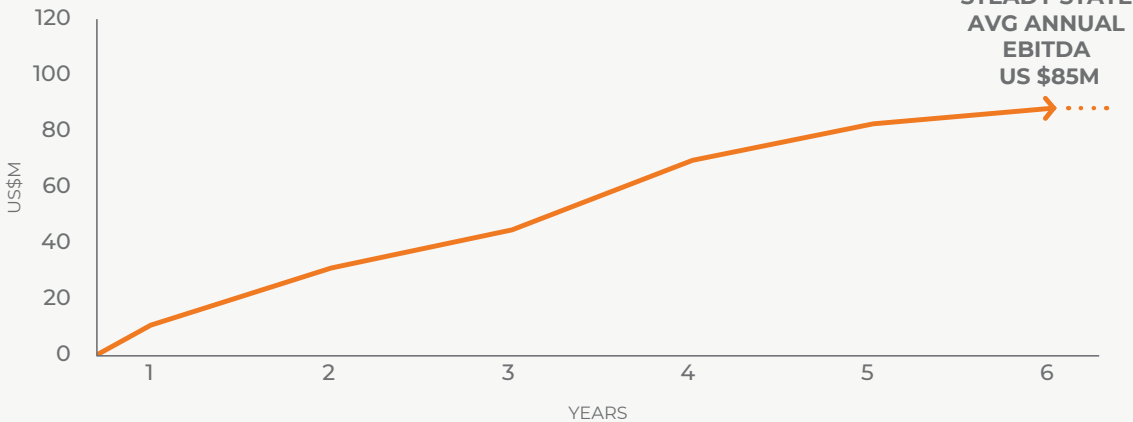


AVERAGE SALES PRICE (CONCENTRATE)

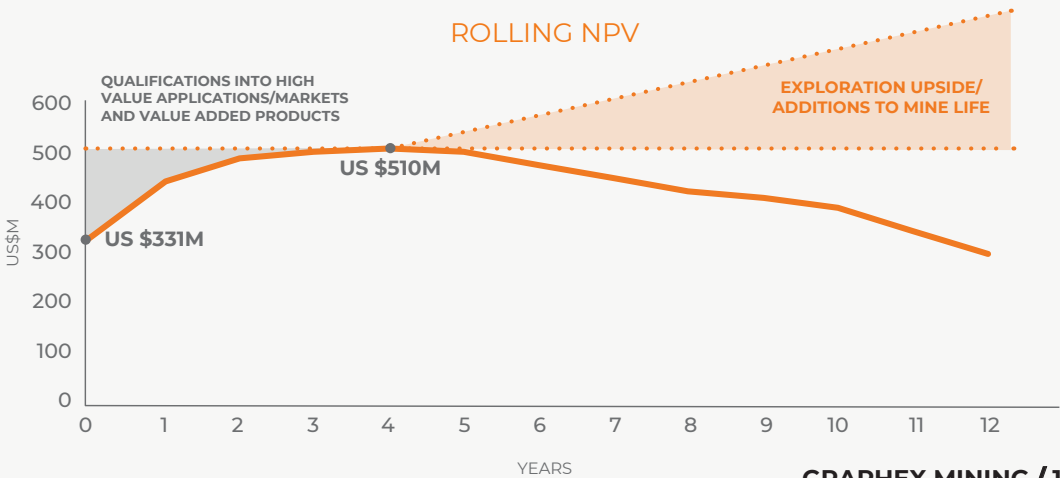
Mesh size	Mass Dist. %	Price Year 1	Price Year 2	Price Year 3	Price Year 4	Average (LOM)
+20	0.7	5,000	5,000	5,000	5,000	5,000
+32	9.8	2,359	2,582	2,895	3,031	3,017
+50	20.6	1,745	1,935	2,235	2,357	2,242
+80	26.9	1,057	1,133	1,251	1,299	1,270
+100	6.3	794	853	945	983	969
-100	35.8	631	637	735	761	749
Weighted average sales price (US\$/t)		1,178	1,303	1,475	1,535	1,534

## OUTCOMES

EBITDA



ROLLING NPV

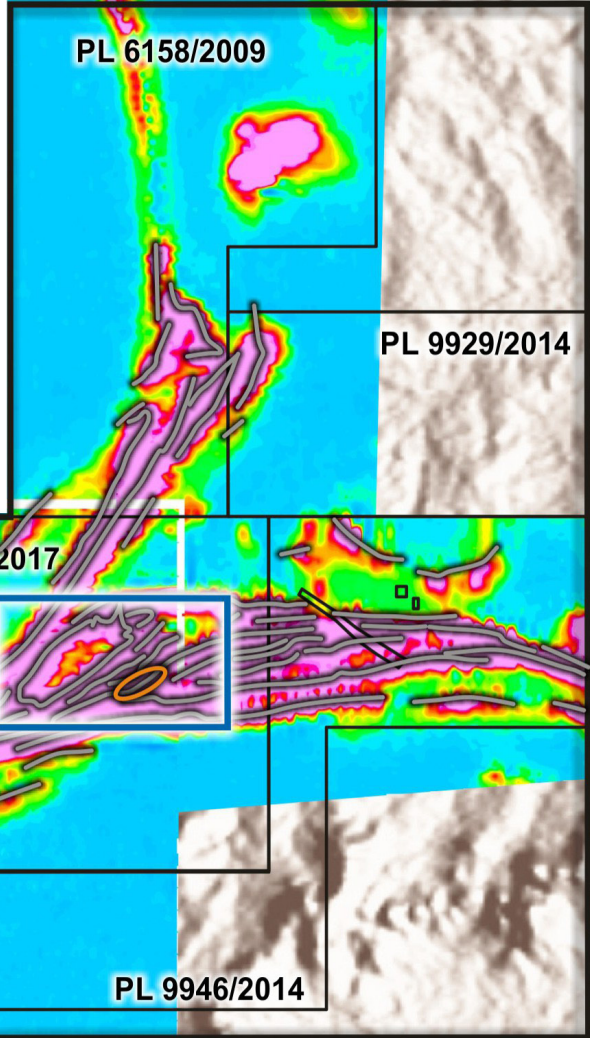


1. ASX Announcement – 29 January 2020 “DFS confirms Chilalo as high-margin graphite project.”

# UPSIDE OPPORTUNITIES

High-conviction opportunities to improve economics + extend project life

Opportunity	Impact
Exploration (see image on right) <sup>1</sup> Faster Optimisation of flake size	Reducing mining costs, increase mine life, facilitate production expansions
Optimisation of flake size	Increase revenues and margins
Production expansion	Increase NPV, cash flows
Faster sales ramp-up / qualification	Increase revenues / margins earlier in project life
Grid power	Reduce operating costs



VTEM IMAGE HIGHLIGHTS  
CONDUCTIVE TARGETS

▭ Mining Licence

▭ Prospecting Licence

— VTEM Conductor Axes



# CHILALO PRODUCT QUALITY

Large flake graphite underpins average sales price

31% graphite product achieves premium price

Unique ability to achieve >99% LOI through flotation

Suitability for targeted high-value applications

Verified by 6 independent labs + 5 independent research institutes

## GPX AVERAGE SALE PRICE

Mesh	Microns	Mass Dist. %	%LOI <sup>2</sup>	LOM Average Sale Price (US\$/t) <sup>1</sup>
+20 Mesh	+850	0.7	95	\$5,000
+32 Mesh	500 - 850	9.8	95	\$3,017
+50 Mesh	300 - 500	20.6	95	\$2,242
+80 Mesh	180 - 300	26.9	95	\$1,270
+100 Mesh	150 - 180	6.3	95	\$969
-100 Mesh	<150	35.8	95	\$747
WEIGHTED AVERAGE SALE PRICE (FOB)				\$1,534

FLAKE SIZE  
PRICE PREMIUM

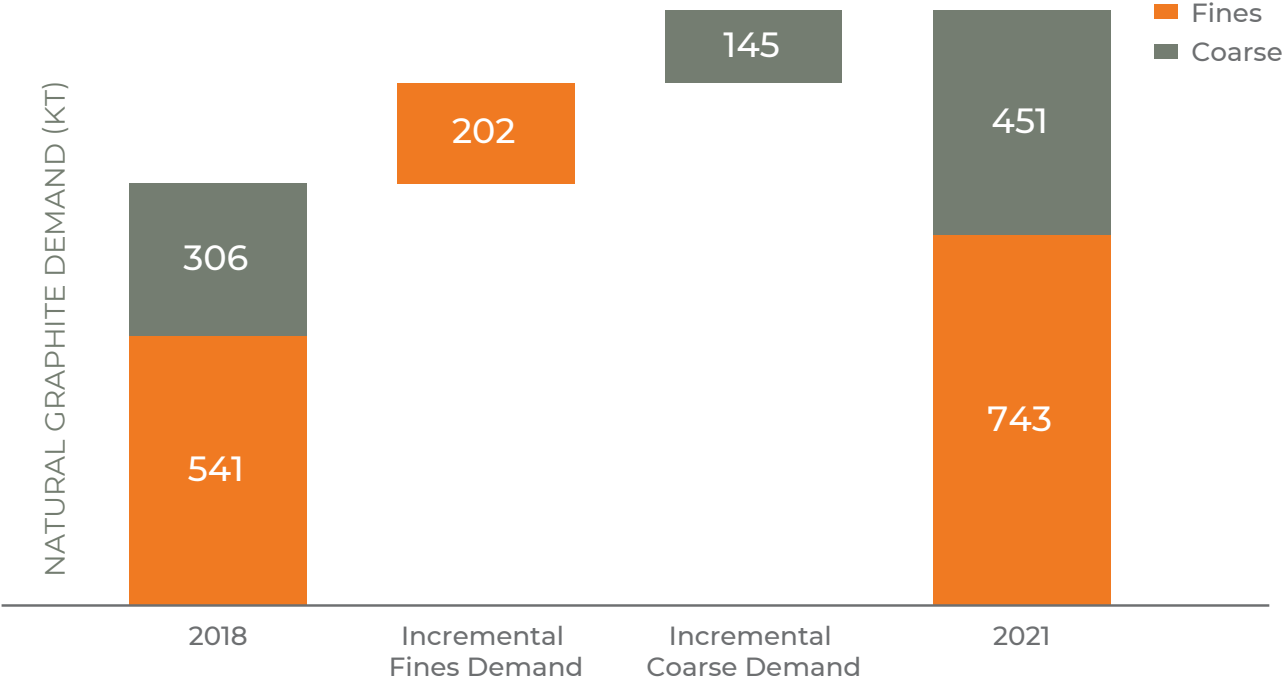
1 Graphex has considered pricing data from numerous independent sources including Roskill, Industrial Minerals, Benchmark Mineral Intelligence, RefWin-China as well as its own expert graphite market consultants. The LOM average sales price reflects higher pricing received when Chilalo concentrate has qualified into high-value applications/markets.  
2. LOI - Loss on Ignition. Graphex is targeting 2 base range purities with 95% LOI being the standard purity product.

# COARSE FLAKE MARKET: PRIMED FOR NEW ENTRANTS

Chilalo unable to meet incremental coarse flake demand

## COARSE FLAKE GRAPHITE MARKET STATE OF PLAY

- Historical dominant supplier (China) has diminished reserves of coarse flake graphite
- Intermittent/unreliable mining of China's remaining coarse flake reserves due to environmental crackdown
- Insignificant and inconsistent coarse flake supply from Africa
- Unfulfilled demand in high-value applications of coarse flake graphite – foils, gaskets and fire-retardants (see image on right)



Source: Benchmark Mineral Intelligence, June 2019

# FLAMMABLE CLADDING RESPONSIBLE FOR FIRE DISASTERS

Global response to drive demand for “graphite-heavy” fire retardants

United Kingdom - 14 Jun 2017

## **GRENFELL TOWER FIRE**

United Kingdom - 28 July 2017

**UK GOVERNMENT ANNOUNCES AN INDEPENDENT REVIEW OF BUILDING REGULATIONS AND FIRE SAFETY.**



United Arab Emirates - 21 Feb 2015 & 4 Aug 2017

## **2X DUBAI APARTMENT FIRES**

United Arab Emirates - 22 Jan 2017

**UAE FIRE AND LIFE SAFETY CODE RAISES THE STANDARDS FOR EXTERIOR CLADDING AND SUPPLEMENT MATERIALS TO REDUCE THE CLADDING'S FLAMMABILITY TO ZERO**



## **INTERNATIONAL FIRE SAFETY STANDARDS COALITION - 12 JULY 2018**

30 country response to flammable cladding issues raised by the Grenfell Tower fire



Tianjin, China - 12 Aug 2015

## **TIANJIN PORT FIRE**



**CHINA BUILDING REGULATIONS AMENDED MANDATING THE USE OF FLAME RETARDANT BUILDING MATERIALS IN FUTURE CONSTRUCTION**

*“China needs 40Mtpa of FRBM's, which will contain 5% expandable graphite.”*  
- Mr Jiang Yang, Group Vice President - China National Building Materials

**19 FIRES INVOLVING BUILDING FLAMMABLE CLADDING WORLDWIDE SINCE 2005**

Perth - 21 Feb 2019

**CLADDING CRISIS SPREADS INTO THE SUBURBS AS NINE MORE PRODUCTS ARE CLASSED AS NON-COMPLIANT**



Melbourne, Australia - 25 Nov 2014

## **LACROSSE APARTMENT FIRE**



NSW, Australia - 05 Dec 2019



**1422 BUILDINGS WERE IDENTIFIED AS LIKELY CONTAINING DANGEROUS COMBUSTIBLE CLADDING**

Victoria, Australia - 28 Dec 2019

**VIC BUILDERS PANIC AS FLAMMABLE CLADDING LIST HITS 1200**



**FIRE DISASTER**



**RESPONSE<sup>1</sup>**

<sup>1</sup> Expandable graphite is substituting previous fire retardant products.



# BUILDING IN-COUNTRY CERTAINTY

Constructive dialogue continues

- Key assurances received from Tanzanian government 16% free-carry, export of graphite concentrate
- Conclusion of Barrick negotiations with Tanzanian government is a positive sign
- Continuing to engage in constructive dialogue with government until final investment decision reached



					
Environmental Certificate	Mining Licence	Integrity Pledge	Local Content Plan	Mine Development Plan	Updated Relocation Action Plan
ISSUED MAR 2016	GRANTED FEB 2017	APPROVED	APPROVED	APPROVED	APPROVED

KEY PERMITS AND APPROVALS ARE IN PLACE

**PHIL HOSKINS**  
8yrs GPX/IMX

**WARREN KING**  
Extensive African project development experience

**STUART MCKENZIE**  
+12yrs GPX/IMX & Anvil Mining

**HEAVENLIGHT KAVISHE**  
Country Manager and ex-senior government official

# CHILALO'S PRODUCTION TIMETABLE

Potential production by Q4 2021 subject to final investment decision Q2 2020

Task	2020				2021				2022	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Project/ Construction							Operations		
1 Final Investment Decision										
2 Relocation and compensation of displaced persons										
3 Engineering and design										
4 Procurement										
5 Enabling Works (Camp, Road, Water supply)										
6 Process plant fabrication and delivery										
7 Bulk Earthworks										
8 Concrete Works										
9 Erection of Steel, Mechanical and Platework										
10 Piping, Electrical and Instrumentation										
11 TSF Construction										
12 Mining (establishment and pre-production only)										
13 Commissioning (pre and water commissioning)										
14 Ramp -up (on ore)										
15 Name Plate Production										



# GROWTH PLATFORM

Graphex graphite market strategy a clear differentiator



## UNIQUE + MARKET LEADING PRODUCT QUALITY

Independant lab verifications justify suitability for high-value applications

## HIGH-MARGIN GRAPHITE

Graphex targets high-value applications with coarse product, whilst fine flake market remains oversupplied

## HYBRID MINER + MANUFACTURER

Transformative manufacturer/'markets-first' strategy complements traditional mining model

## CONSTRUCTION FUNDING ARRANGEMENTS

Graphex working with financier to procure construction funding





# CORPORATE OVERVIEW

## CAPITAL STRUCTURE

Market Cap	<b>A\$17M</b>
Shares on Issue	<b>101M</b>
Unlisted Options	<b>5.9M</b>

## MAJOR SHAREHOLDERS

J P Morgan Nominees Australia Limited	<b>8.3%</b>
BNP Paribas Nominees <DRP>	<b>6.5%</b>
Capital DI Limited	<b>6.0%</b>
BNP Paribas Nominees <IB AU Noms Retail Client DRP>	<b>5.2%</b>
MMG Exploration Holdings	<b>3.5%</b>

## BOARD & MANAGEMENT

Stephen Dennis	Non-executive Chairman
Daniel Saint Don	Non-executive Director
Phil Hoskins	Managing Director
Warren King	Project Manager
Chris Knee	CFO
Stuart McKenzie	Company Secretary/ Commercial Manager

## JORC TABLE

DOMAIN	CLASSIFICATION	TONNES (MT)	TGC%	CONTAINED GRAPHITE (KT)
High-grade zone	Probable Reserve	9.2	9.9	878
Total ore reserves	Probable Reserve	9.2	9.9	878
High-grade zone	Indicated	10.3	10.5	1,082
High-grade zone	Inferred	9.8	9.3	908
Total high-grade resource	Indicated and Inferred	20.1	9.9	1,991
Low-grade zone	Inferred	47.3	3.5	1,677
Total resource	Indicated and Inferred	67.3	5.4	3,667





# Graphex

MINING

Level 1, Emerald House, 1202 Hay Street  
West Perth WA 6005 Australia

Telephone: +61 8 9200 4960

Facsimile: +61 8 9200 4961

Email: [info@graphexmining.com.au](mailto:info@graphexmining.com.au)

