

ASX:DRX

# Time to shine.

Advanced, high grade, low-cost silica project located adjacent the world's largest silica mine

Diatreme Corporate Presentation  
November 2020



**DIATREME**  
Resources

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Whilst Diatreme Resources has concluded that it has a reasonable basis for providing the forward looking statements included in this presentation, Diatreme Resources advises that given the current price of zircon and the company’s current market capitalisation (compared to the capital expenditure required in connection with the Cyclone Zircon Project), the production targets and forecast financial information contained in this presentation do not provide an absolute assurance of economic development at this stage. The stated production targets and forecast financial information contained in this presentation are based on detailed PFS studies and Diatreme Resources’ current expectations of future results or events, including sourcing of project development finance within the targeted timeline and/or attracting suitable project major financial partners and should not be relied upon by investors when making investment decisions.

The Resource Estimates and Production Targets were reported by the Company on 12<sup>th</sup> May 2020 and 9<sup>th</sup> September 2019, continue to apply and have not materially changed. Diatreme confirms that it is not aware of any new information or data that materially affects the information included in these announcements and that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.

## Additional Information

This presentation should also be read in conjunction with the DRX Annual Report for 2019, the March 2020 ,June 2020 and September 2020 Quarterly Activities reports, together with any announcement made by Diatreme in accordance with its continuous disclosure obligations under the Corporations Act including but not limited to the following ASX releases:

- 13 March 2018 – “Cape Bedford Exploration Update”
- 2 March 2018 – “Testwork Confirms Prospects For New Silica Sand Mine”
- 7 February 2019 – “Galalar Silica Project Exploration Results Update”
- 7 March 2019 – “Galalar Silica Resource expands 22% to 26.4 million tonnes”
- 25 March 2019 – “Large silica exploration target boosts Galalar’s prospects”
- 27 March 2019 – “\$1.5m placement to progress Galalar Silica Project”
- 11 April 2019 – “New silica targets & heavy minerals discovery at Galalar”
- 14 May 2019 – “Galalar Silica Project further expands with maiden Indicated Resource”
- 20 June 2019 – “Boost for Galalar with sampling of regional exploration targets confirming continuity of high silica grades”
- 21 June 2019 – “Re-release: Boost for Galalar with sampling of regional exploration targets confirming continuity of high silica grades”
- 16 July 2019 – “Offtake MOU on Galalar Silica Project Signed With Fengsha Group”
- 7 August 2019 – “Regional support builds for Galalar silica mine”
- 9 September 2019 – “Galalar scoping study emphasises high return potential” (ASX release of Scoping Study)
- 19 September 2019 – “Second MOU signed for Galalar silica offtake”
- 29 November 2019 – ‘Product upgrade potential for Galalar’
- 23 December 2019 – “Mining Lease Application lodged for Galalar Silica Project”.
- 27 January 2020 – “Application to conduct voluntary EIS lodged for Galalar Silica Project”.
- 6 February 2020 – “EIS application lodged for Galalar
- 20 February 2020 - Galalar silica resource expanded 26%
- 8 April 2020 - Galalar regional economic study
- 12 May 2020 - Galalar silica resource expanded 25%
- 24 July 2020 - Diatreme advances Galalar Environmental Approvals
- 22 September 2020 – Drilling program highlights Galalar expansion potential
- 9 October 2020 – Capital Raising to Progress Galalar

Our vision is to become a producer of high-quality silica and mineral sands for use in growing global solar PV and ceramics markets



One of the world's purest silica sands projects. Total Mineral Resource\*

**47.5Mt**

@ 99% silica oxide



**Global Silica Consumption Growing Fast**

Soaring silica sands consumption parallels rising demand world wide for solar PV panels whose primary component (70%) is glass sheeting manufactured from “low iron” sand.



**Tier 1 Jurisdiction**

Close proximity to the world's largest silica sands project at Cape Flattery (Mitsubishi-owned) operating 30 years+



**Robust Economics, Advancing Fast**

- Low capex and opex requirements.
- Production target 2022.
- Sufficient reserves to support 15-year mine life.
- 750,000 tonnes per year of solar-grade silica.
- Close to port and growing Asian markets.
- MOU's signed with world leading offtakers.
- Backed by traditional owners, Hopevale Congress.

*Note: Refer to ASX announcement on 12 May 2020 – “Galalar silica resource expanded 25%”. Diatreme confirms it is not aware of any new information or data that materially affects the information included in these announcements and that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed*



## Corporate overview

### Post October placement & SPP

Share price

**A\$0.013**

4 November 2020 close  
52 week high \$0.015, low \$0.008

Shares on issue

**2,319m**

253m shares still to be issued from SPP

Options

**231.7m**

50m – Exp 30/06/21 @ \$0.024  
181.7m – Exp 4/2/22 @ \$0.020

Performance rights

**3.3m**

Market capitalisation

**A\$30.1m**

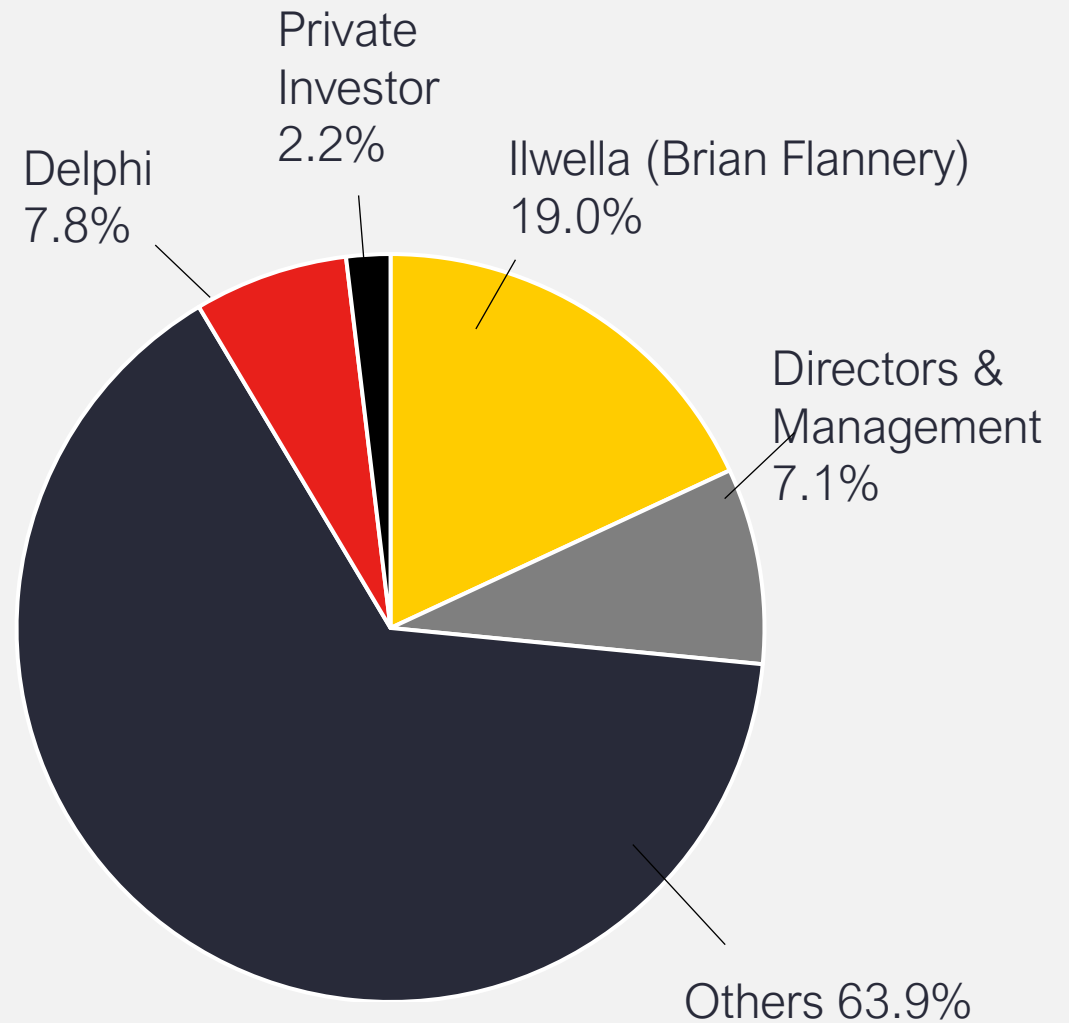
Cash

**A\$4.7m**

4 November 2020  
Also \$2.5m raised from SPP 10 Nov 2020

Debt facility (unsecured)

**A\$1.5m**



Shareholder interests at 4 Nov 2020

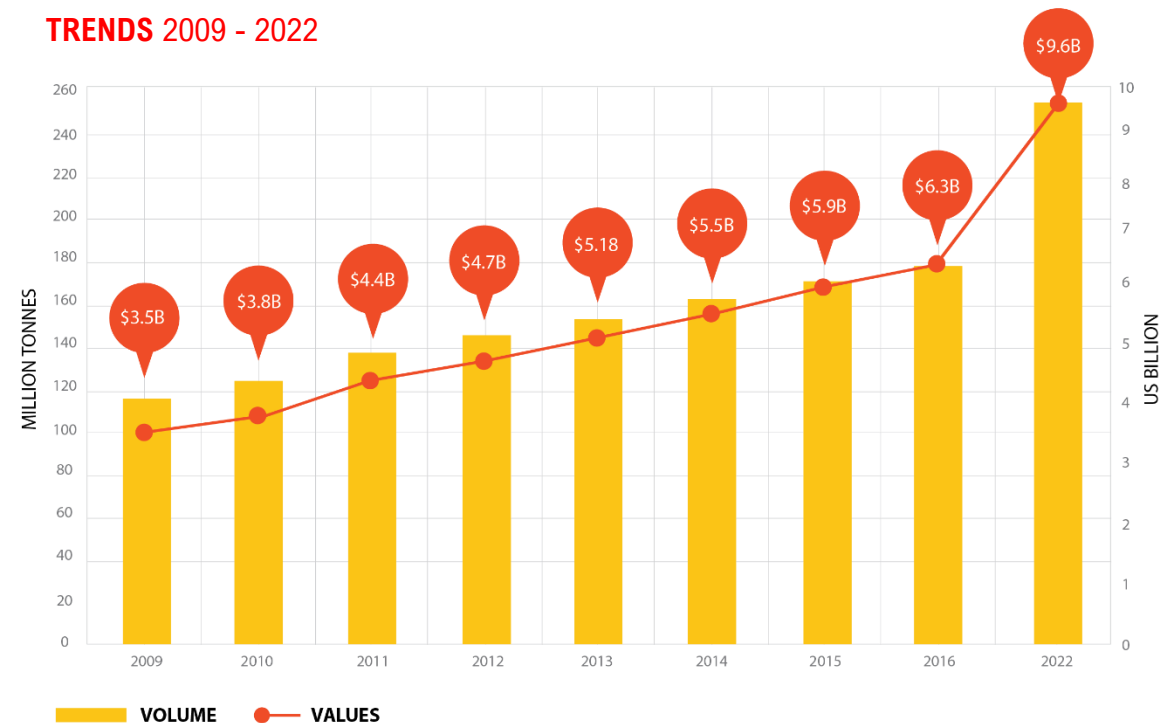


## Growing global demand

- Silica sand has many uses, the market is experiencing increasing demand from emerging consumers such as China and India from foundry, automotive and construction industries including the solar PV market.
- IMARC forecasts compound annual growth rate (CAGR) of 7.2% per year through to 2022, reaching US\$9.6B revenues\*.
- Accelerating growth in solar panel market, where silica is the main component (70%).
- Supply is diminishing as a lot of the sand used in Asia comes from rivers where environmental concerns are increasingly restricting extraction.
- No direct substitutes in majority of applications.

\* Refer DRX announcement, 30 November 2017

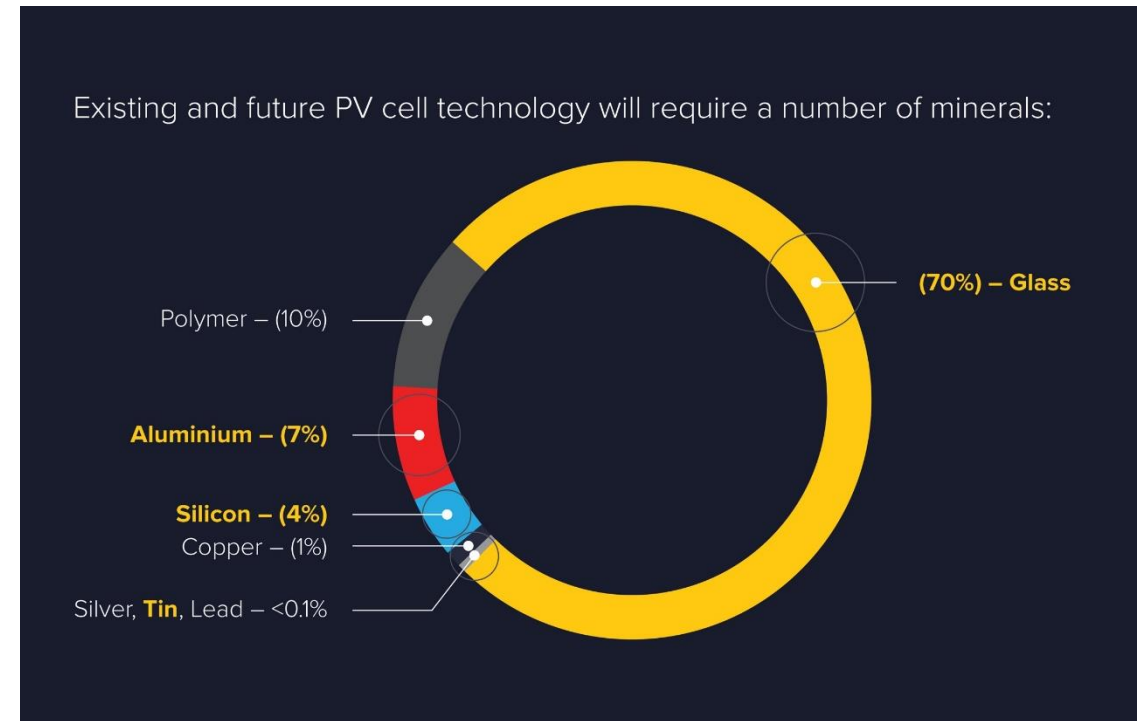
**GLOBAL SILICA SAND MARKET VOLUME AND VALUE**  
**TRENDS 2009 - 2022**



## Solar market consuming more sand for panel manufacturing

- Solar panel PV market forecast to reach US\$48.2 billion by 2025, with a CAGR of 34.7%\*
- World Bank estimates global renewable capacity will grow by over 1TW from 2018 to 2023, up 46%, with solar PV accounting for more than half of this growth
- Galalar project confirmed capable of supplying solar PV market with premium product
- Solar panel manufacturers' feed stock requires >99% purity silica with less than 100ppm iron oxide levels
- Est. 70% of each 'typical' commercial solar panel comprises glass sheeting made from 'low iron' high purity silica

\* Source: Bizwit Research & Consulting



Source: "Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition," World Bank, 2020



## POSITIVE SCOPING STUDY RESULTS

SEPTEMBER 2019

- Pre-tax NPV \$231m, IRR 150% and estimated capital payback within 8 mths
- Estimated development capex \$24.4m based on trucking product for transshipment outside Cooktown
- Product price estimate US\$75/t (A\$107); annual cash costs \$43.5m, cash margin \$36.8m
- Potential for significant improvement to project economics including logistical solution with purpose-built barge ramp at Nob Point, which could cut \$20-\$25/t (trucking and transshipment costs) from operating costs
- Additional improvement from developing ultra-low iron silica sand, currently trading at significant price multiple
- 15-year mine life with annual mining rate of 950,000t, producing 750,000t low-iron silica product (79% recovery rate)
- Exploration targets identified within 1km of Mineral Resource, offering potential to expand project
- Potential to generate 30-40 jobs in construction phase and 60 (plus) in production; drive-in, drive-out workforce

*Note: Refer to ASX announcement on 9 September 2019 – “Galalar scoping study emphasizes high return potential” and 12 May 2020 – “Galalar silica resource expanded 25%” . Diatreme confirms it is not aware of any new information or data that materially affects the information included in these announcements and that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.*

A compelling opportunity

Targeted Annual DRX silica production

0.75Mt 

Annual global silica consumption

250Mt

Annual gross revenue  
A\$80m

Annual operating costs  
A\$42m

Annual operating margin  
A\$37m

x 15 years  
Project life

Total net revenue  
A\$555m





## Key upcoming company value catalysts

October 2020	Capital Raising to advance DRX to Approvals and FID
Q4 2020	Lodge NAIF application for initial Project Funding assessment
Q4 2020	Advancement on final transshipment and logistics solutions
1H 2021	Offtake advanced to binding arrangements
1H 2021	Assemble other project level debt/ offtake finance support
Q4 2021	Final approvals targeted for Mining Lease
Q4 2021	Final environmental approvals targeted

**Note:** Timing expectations are based on current best estimates and may be subject to change

# GALALAR

SILICA SANDS  
PROJECT



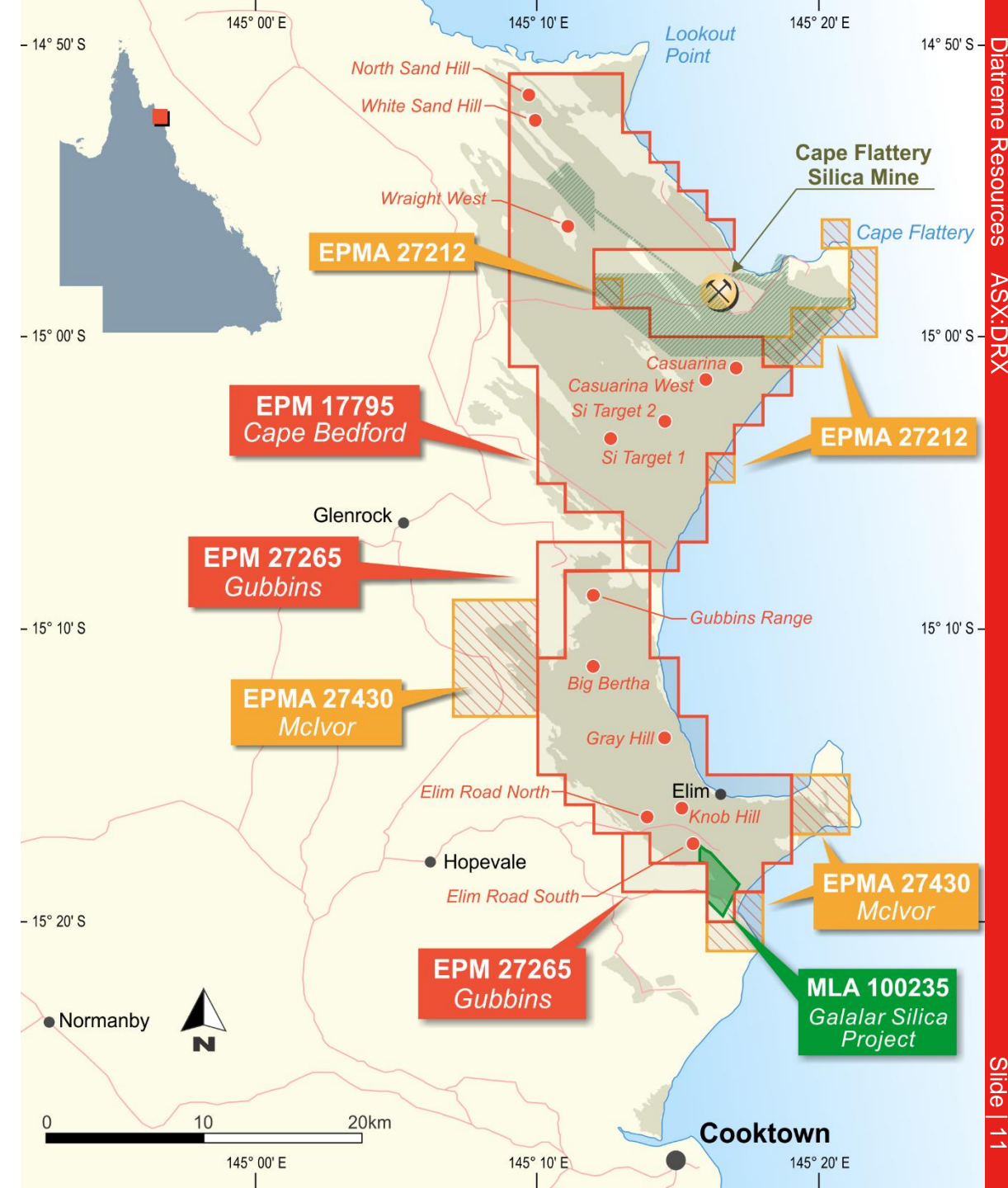
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# Galalar Silica Project

## Premium quality silica

- Project located 20km north of Cooktown, FNQ adjacent to world's largest silica sand mine at Cape Flattery (Mitsubishi-owned) operating 30 years plus
- Diatreme holds dominant exploration position in known silica province at over 500 sq km
- High purity silica resource identified (47m tonnes)
- Short-term pathway identified to cashflow via low capex project, targeting production by 2022
- Offtake MOU's with potential to supply up to 750,000 tonnes for solar PV market
- 2019 Scoping Study showed favourable economics, including pre-tax NPV \$231m, IRR 150% and capital payback in 8 mths
- Advancing permitting, approvals and preferred logistics solution with Qld and Commonwealth Govt's

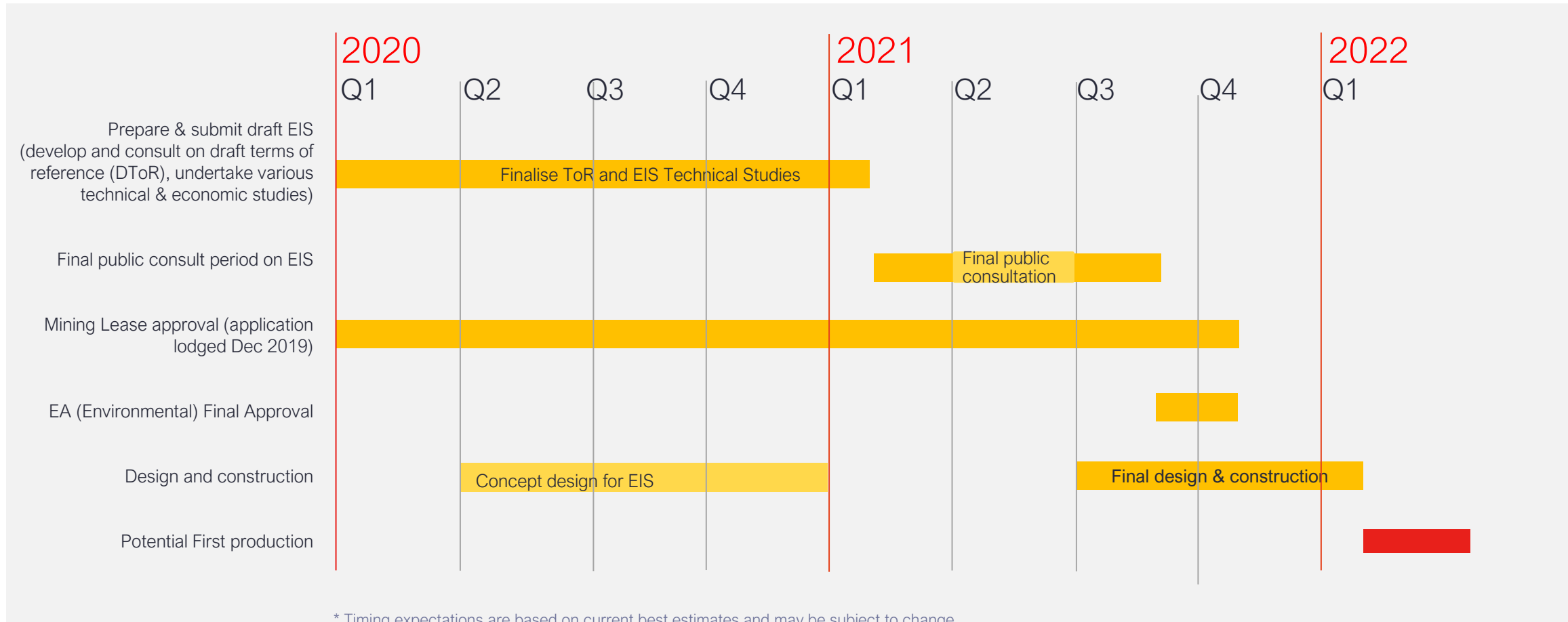


## Scoping study snapshot



**Note:** Refer to ASX announcement on 9 September 2019 – “Galalar scoping study emphasizes high return potential”. Diatreme confirms that all material assumptions underpinning the production targets and forecast financial information from those production targets, as reported on 9 September 2019, continue to apply and have not materially changed.

## Near-term production

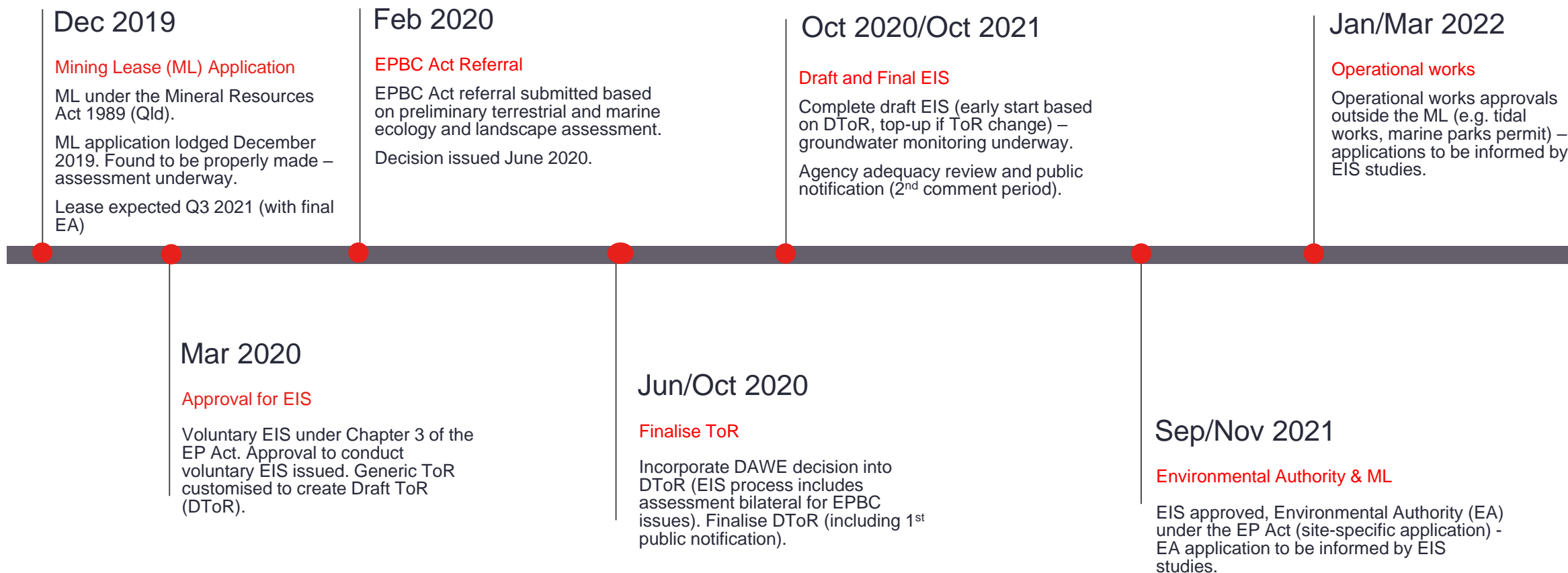


\* Timing expectations are based on current best estimates and may be subject to change



# APPROVALS

## EXPECTED PROJECT TIMELINES



\* Subject to and contingent upon the project advancing through various statutory processes and necessary approvals



## EIS STUDIES

### COMPLETED WORK

#### Terrestrial Ecology:

- Wet season survey January 2019
- Dry Season survey August 2019
- Modelling and constraints analysis January 2020
- Supplementary wet season survey January 2020
- Supplementary dry season survey & orchid & quoll surveys June/July 2020

#### Marine Ecology & Coastal Processes:

- Rapid Field Habitat Assessment (Endeavour River, Nob Point, both anchorages) January & May 2020
- Seastate monitoring and modelling June 2020

#### Landscape & Visual Marine Ecology:

- Desktop assessment of OUV January / February 2020

#### Hydrographic survey:

- Nob Point barge ramp site October 2018

#### Land survey:

- Lease boundary, DEM 2019
- LidAR survey and detailed DEM August 2020

#### Hydrogeology:

- Walkover and Concept Model March 2020
- Planning for fieldwork August/September 2020

#### Infrastructure & Transport:

- Concept design of Nob Point loading and access infrastructure May/September 2020
- Preliminary Transport study commenced September 2020

# EIS STUDIES – THE TEAM

Environment North		David Rivett (Study Manager) EIS management and reporting / Approvals Hazards & Safety	BMT		Greg Fisk (Co-Study Manager) Approvals Matters of National Environmental Significance
Aquamap		Data (Hydrographic Survey)	Cummings Economics		Economic Assessment
ASK Consulting Engineers		Noise & Air & Greenhouse	Geographica		Data Management Mapping GIS
Ausrocks		Mine design	GHD		Transport
Biotropica Australia		Terrestrial Ecology Rehabilitation	Golder Associates		Hydrogeology & groundwater dependent ecosystems (GDEs) Waste Management
BMT		Coastal Processes Marine Ecology	LatStudios		Landscape & Scenic
Coffey		Social Impact Assessment & Social Impact Management Plan	Pandanus Solutions		Consultation
Converge Archaeo		Indigenous and Non-indigenous Cultural Heritage	SMEC		Land-based Infrastructure
			Veris		Data (Terrestrial Survey / Topography)





## High quality silica product

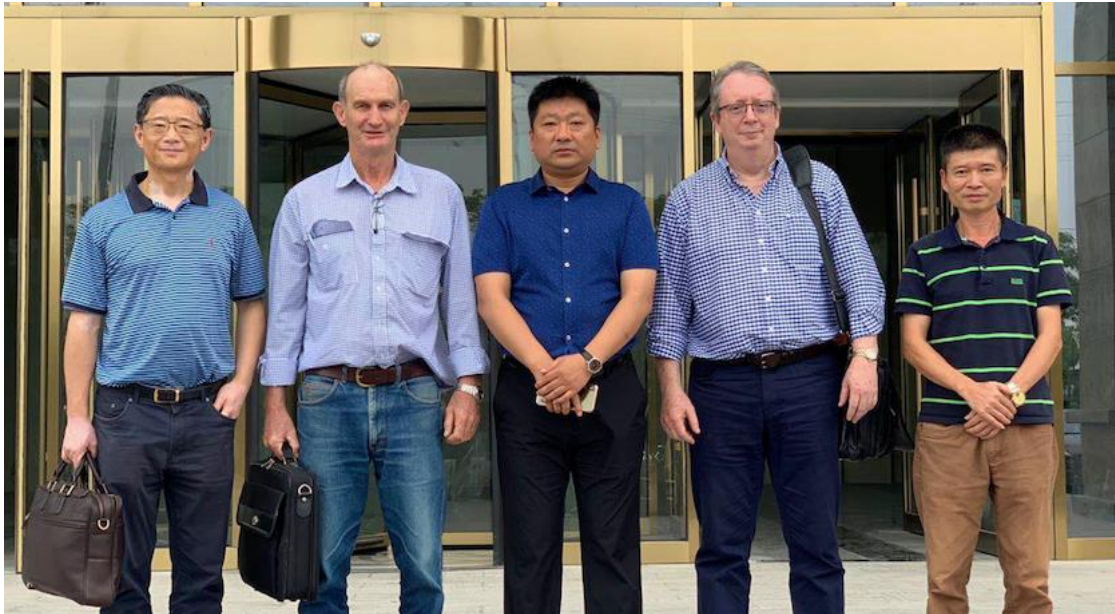
- The sand from the Galalar project is some of the world’s purest.
- Bulk sample testwork confirms ability to produce premium grade silica product for high-end glass & solar panel manufacturing (which demands minimum iron content).
- Solar panel manufacturers’ feed stock requires >99% purity silica with “low iron” less than 100ppm iron oxide levels

Galalar expected quality – From bulk product testing

Iron oxide	Silicon dioxide	Particle size distribution	Titanium dioxide	Aluminium oxide
<b>=&lt; 85ppm</b>	<b>=&gt; 99.7%</b>	<b>109-700</b> Microns 24-140 mesh	<b>&lt; 140ppm</b>	<b>&lt; 500ppm</b>
International required specifications <100ppm 100% in range	International required specifications >99% 100% in range	International required specifications 109-700microns 98% in range	International required specifications <400ppm 100% in range	International required specifications <1000ppm 100% in range



## Offtake MOU agreements in place



- Diatreme has secured an MOU off-take agreement with the Fengsha Group, China's largest processor and supplier to solar photovoltaic panels manufacturers and specialty high end silica sand related products.
- Agreement to supply of up to 500,000tpa with an option to increase this to 750,000tpa.
- Fengsha deal also includes technical support, market access and potential for direct investment.
- Second 500,000t low iron silica product MOU signed with Wan Zhong Investment Group.



## Fengsha facilities, China



Chemical pickling vats



Mineral Separation Plant



Thin Film Transistor line

## Strong stakeholder support



**Note :** Refer ASX release dated 8 April 2020 – “Galalar regional economic study” for detail on full economic report.

- Project being developed with support of traditional owners through Hopevale Congress Aboriginal Corporation (12.5% direct “free carry” stake) the RNTBC entity, representing the interests of all affected native title holders.
- Traditional owners hold freehold and native title over entire tenement area.
- Strong support from all levels of government, including State and local level.
- Independent economic study (Cummings Economics) shows project would inject \$23-24m in construction phase and up to \$42m in operation for benefit of Hopevale/Cooktown region, while generating 110 (FTE) jobs and \$1.475m p.a. in state





## Expanding mineral resource

- Scoping Study production target derived from 2018 JORC Resource.
- Planned drilling in 2020/21 to expand and upgrade the size of the existing resource and lower the overall waste-to-ore ratio for the project.
- Significant JORC Exploration Target highlights potential to expand resource.

JORC Resource Estimate  
6 May 2020





## Simple processing system

- Amenable to low capex & opex

- No caustic chemicals or dust



Front end loader



Hopper conveyor



Trommel



Spiral separator



Hydrocyclone product stacker



Wet high-intensity magnetic separators



Classifiers



Attrition scrubber

## Export option Scoping Study: Cooktown

- Nine trucks operating 12 hours per day via existing road network from mine site to Cooktown (63km). 50 tonnes per truck, 42 loads daily, 360 days per year.
- Stockpile up to 25,000 tonnes at barge loading facility. Refurbishment of existing barge ramp facility on Marton River in Cooktown. Barges transport product 10km on river to ship at anchor for transshipping.
- Transshipment from Cooktown port. Normal shipment 35,000t.
- 10 days to load a ship.
- Shipment every 2-3 weeks.





## Export option 2: Nob Point Optimised transport solution

- Construction of new 3.6km road from mine site to purpose-built barge ramp at Nob Point (subject to Qld Govt approvals), saving significant trucking opex costs
- Reduces truck and barge impacts on community
- Barging 750,000t of silica product per year over open water to ship transfer site (5,000t barges)
- Transhipping activity undertaken within the Cape Flattery designated port defined area (in GBRMP exclusion zone)
- Currently working with Qld Govt seeking potential development consents
- Strongly supported by Hopevale Congress and regional stakeholders





## Resource statement Galalar Silica Project

### Galalar Indicated/Inferred/Measured Mineral Resource 47.5Mt >99% SiO<sub>2</sub>

<u>JORC Category</u>	<u>Al<sub>2</sub>O<sub>3</sub> Grade</u>	<u>Fe<sub>2</sub>O<sub>3</sub> Grade</u>	<u>TiO<sub>2</sub> Grade</u>	<u>Cut-off SiO<sub>2</sub>%</u>	<u>SiO<sub>2</sub>% Grade</u>	<u>Silica Sand (Mm<sup>3</sup>)</u>	<u>Density (t/m<sup>3</sup>)</u>	<u>Silica Sand (Mt)</u>
Inferred	N/A	N/A	N/A	99.0%	>99.0%	6.54	1.62	10.59
Indicated	0.08	0.06	0.10	98.50	99.10	3.71	1.62	6.02
Measured	0.11	0.09	0.10	98.50	99.28	19.07	1.62	30.89
<b><u>Total Inferred + Indicated + Measured</u></b>						<b><u>29.32</u></b>	<b><u>1.62</u></b>	<b><u>47.50</u></b>

\* Resource estimate current as of 6 May 2020

# APPENDIX



**DIATREME**  
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# CYCLONE

ZIRCON PROJECT



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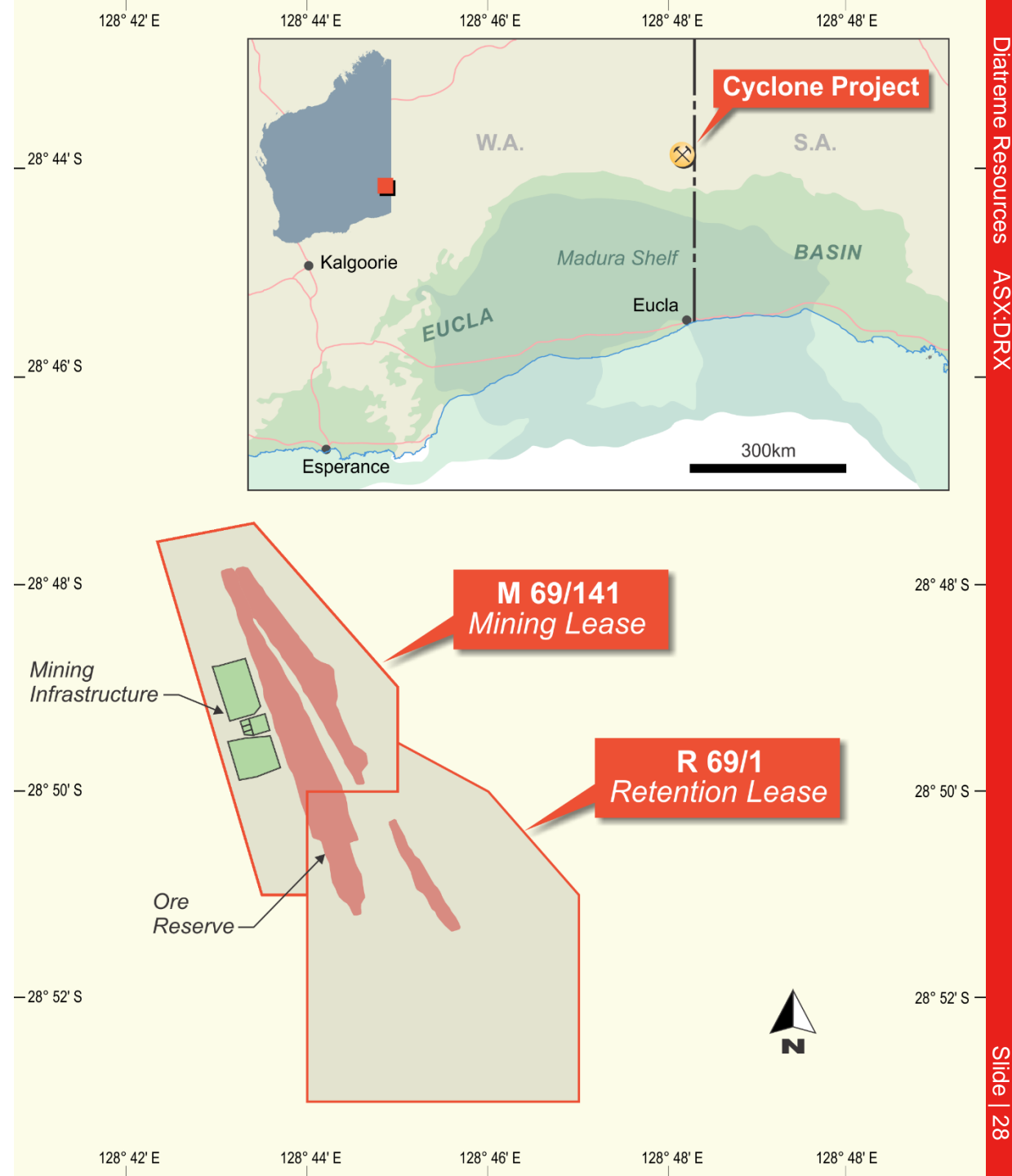


# Cyclone Zircon Project

## Ready for development

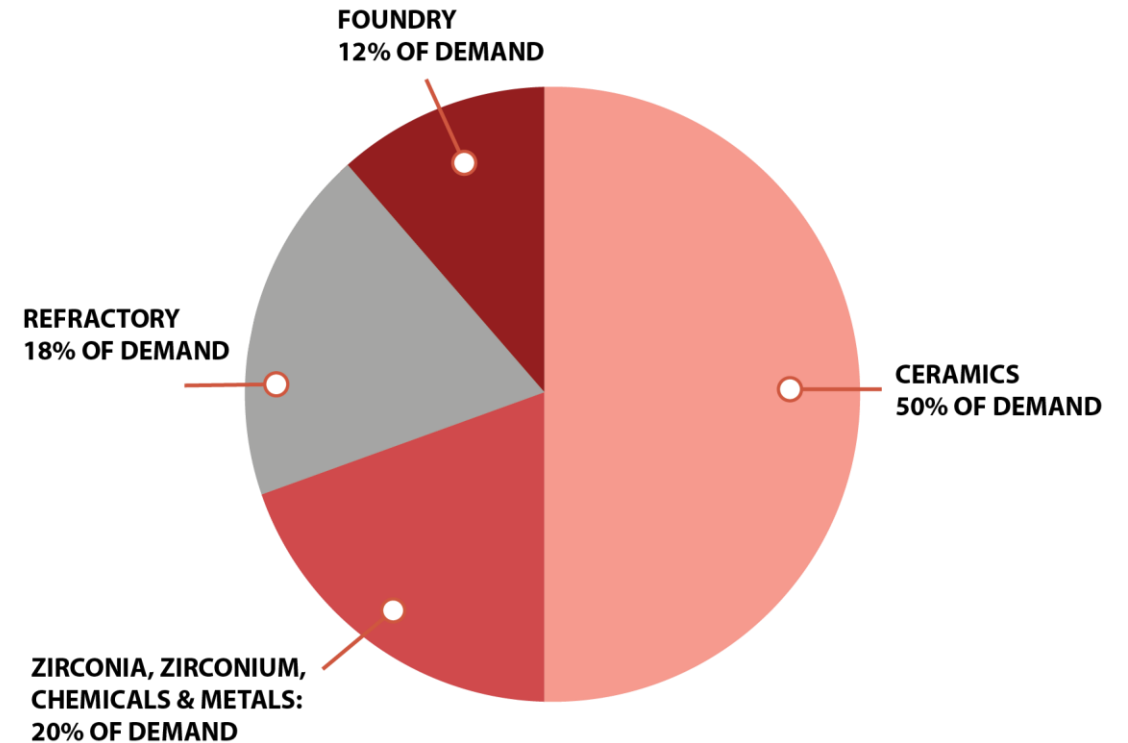
- Corporate advisers appointed to support progression of the project and ensure maximum shareholder benefit received.
- JORC Resource: 203Mt @ 2.3% HM (1% HM cut-off grade), containing 4.7Mt HM & 1,262 Kt zircon
- Strategic metal hafnium identified within zircon component
- 2018 Definitive Feasibility Study returned favourable economics:
  - Pre-tax NPV \$113m, IRR 27% and estimated capital payback within 3 years.
  - Capital costs - \$135m
  - Life of Mine (LOM) production of 1.94Mt of heavy mineral concentrate, containing 936kt zircon, producing 772kt of zircon final product
  - ENFI, part of major SOE Chinese mining group China Minmetals, formally endorses the project and recommends immediate development.

**Note:** Refer to ASX announcement on 15 November 2018 – “Positive DFS confirms Cyclone’s potential as new zircon mine”. Diatreme confirms that it is not aware of any new information or data that materially affects the information included in these announcements and that all material assumptions and technical parameters underpinning the estimates, continue to apply and have not materially changed.



## Valuable heavy mineral

- Most valuable heavy mineral, with current prices US\$1,487/t (2018: US\$1,351/t)\*
- Global zircon production in 2018 approx. 1.2Mt.
- Zircon primarily used to produce ceramic tiles, as well as other applications including refractories, foundry casting
- Speciality applications in nuclear fuel rods, jet turbine blades

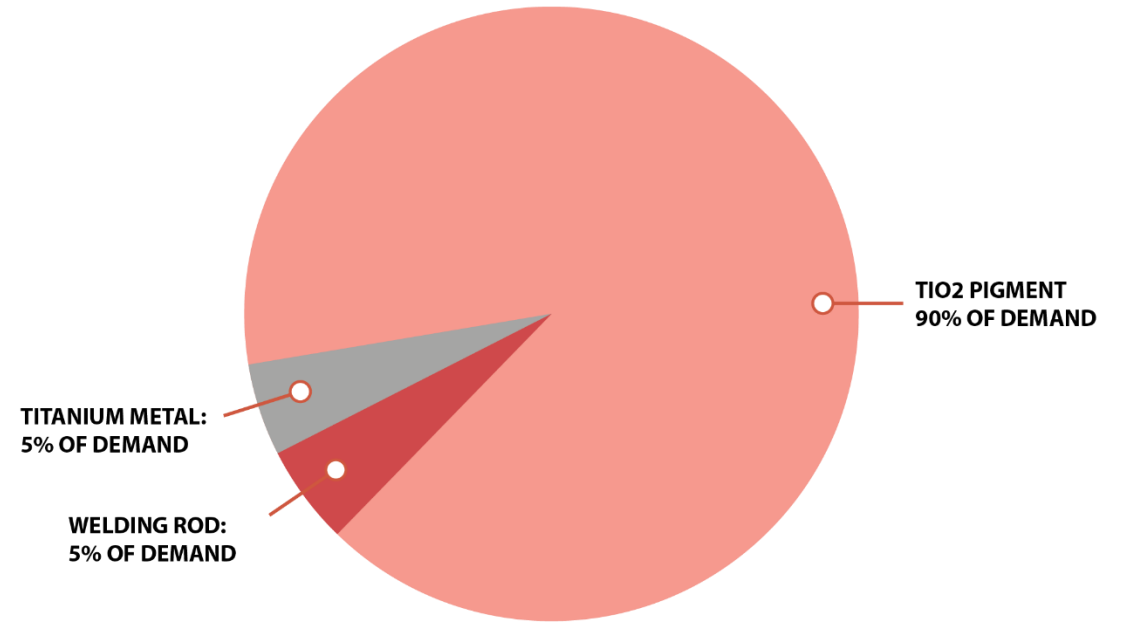


\*Source: Iluka Resources, 20 February 2020



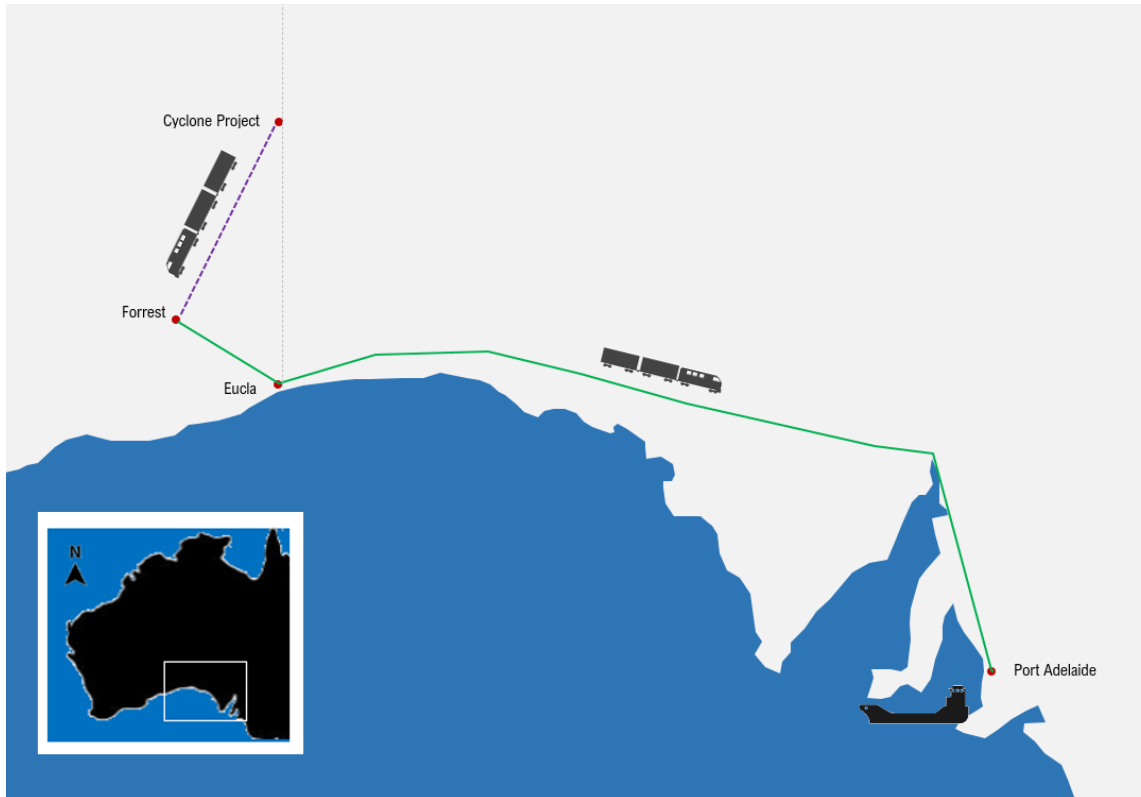
## Growing global demand

- Around 7.4m tpa global market (2018)\*.
- Rutile price averaged US\$1,142/t in 2019 (2018: US\$952/t)\*.
- Used primarily in pigments.
- Demand increasing due to higher environmental standards in China and technological advancements.



\*Source: Iluka Resources, 20 February 2020

## Low-cost transportation



- HMC loaded into containers at Cyclone. 33 tonne per container.
- 240 kilometre truck transport by road from Cyclone to Forrest rail siding in 100 tonne loads.
- 1,100 kilometre rail transport from Forrest siding to Port Adelaide in 3,000 tonne loads
- Containers stacked at Port Adelaide until 15,000 tonnes accumulated. Crane uses container rotator to bulk load a Handysize ship for transport to China.



## Easy mining process

### Project Development Options:

- Mineral Separation Plant in Australia – final products from Australia
- Mineral Separation Plant in China or other country
- Direct sale of HMC within Australia
- Direct sale of HMC offshore

Mining & Logistics	
Strip Ratio	1 : 1
Mining Rate (Dry)	1,300 tonnes per hour – 2 x Dozer traps
Wet Concentrator Plant Product	20 Tonnes / Hour HMC production 144,000 tpa @ 96% HM Concentrate
Transport - Road	240km - 100 tonne loads to Forrest
Transport - Rail	1,100km – 3,000 tonne loads to Port Pirie



## Project fundamentals

- **All primary project approvals in place:** Mining Lease, traditional owner agreements, environmental approvals
- **Sufficient reserves to support a long mine life:**
  - Currently 14 years at 10Mt pa
  - Strand mineralisation gives options for high grading
  - Substantial resource base to support potential long-term expansion
- **Support from traditional owners to develop project:**
  - Strong relationship, mining agreement signed
- **No competing land use**
  - Quaternary dune field, Great Victoria Desert



## Resource statement Cyclone Zircon Project

Category	HM cut-off %	Material Mt	HM %	HM Mt	Slime %	OS %	Head Grade						Zircon Kt
							Zircon %	Rutile %	Leuco %	HiTi %	Alt Ilm %	Si TiOx %	
MEASURED	2.0	69	3.7	2.58	3.6	3.8	1.06	0.11	0.24	0.88	0.45	0.82	735
MEASURED	1.5	102	3.1	3.14	3.9	4.4	0.88	0.09	0.20	0.73	0.38	0.67	896
MEASURED	1.0	156	2.4	3.81	4.2	5.0	0.69	0.07	0.16	0.58	0.30	0.53	1,079
INDICATED	2.0	13	3.2	0.41	3.8	4.4	0.66	0.07	0.18	1.06	0.55	0.60	83
INDICATED	1.5	24	2.5	0.60	4.1	5.0	0.52	0.05	0.12	0.84	0.41	0.46	123
INDICATED	1.0	48	1.9	0.89	4.4	5.1	0.38	0.04	0.09	0.62	0.30	0.34	183
<b>TOTAL</b>	<b>2.0</b>	<b>82</b>	<b>3.6</b>	<b>2.99</b>	<b>3.6</b>	<b>3.9</b>	<b>1.00</b>	<b>0.10</b>	<b>0.23</b>	<b>0.91</b>	<b>0.47</b>	<b>0.79</b>	<b>818</b>
<b>TOTAL</b>	<b>1.5</b>	<b>126</b>	<b>3.0</b>	<b>3.75</b>	<b>3.9</b>	<b>4.5</b>	<b>0.81</b>	<b>0.08</b>	<b>0.18</b>	<b>0.75</b>	<b>0.38</b>	<b>0.63</b>	<b>1,019</b>
<b>TOTAL</b>	<b>1.0</b>	<b>203</b>	<b>2.3</b>	<b>4.70</b>	<b>4.2</b>	<b>5.0</b>	<b>0.62</b>	<b>0.06</b>	<b>0.14</b>	<b>0.59</b>	<b>0.30</b>	<b>0.49</b>	<b>1,262</b>
<b>Mineral Assemblage</b>							<b>27%</b>	<b>3%</b>	<b>6%</b>	<b>26%</b>	<b>13%</b>	<b>21%</b>	

### Notes:

- Refer to ASX release 15 June 2016 “Cyclone Study Reaffirms Project Profitability” for more detail
- Rounding may generate differences in last decimal place
- A constant SG of 1.7 has been used to derive material tonnes
- Slime refers to material typically <53um; OS refers to material typically >2mm
- Mineral Assemblage derived from QEMSCAN® analysis
- High Titanium Oxides (HiTi) – Ti-oxides containing 70 - 95% TiO<sub>2</sub>, Altered Ilmenite (Alt Ilm) – Ti-oxides containing <70% TiO<sub>2</sub>, Siliceous Ti-Oxide (Si TiOx) – Ti-oxides containing >10% silica rich Ti minerals.
- Resources are inclusive of Reserves (refer ASX announcement 27 April 2017).

## DIATREME CONTACT DETAILS

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