



**VRX**SILICA

# Silica Sand Essential to world growth Market Update

---

January 2020





# Disclaimer

This document has been prepared by VRX Silica Limited (VRX). The information contained in this document is for information purposes only and has been prepared for use in conjunction with a verbal presentation and should be read in that context.

The information contained in this document is not investment or financial product advice and is not intended to be used as the basis for making an investment decision. In preparing and providing this document, VRX has not considered the objectives, investment profile, financial position or needs of any particular recipient. Mineral exploration is subject to significant risk. There is no guarantee of exploration success, and even if exploration success is achieved, there is no guarantee that development of any mineral deposit will be economically viable. VRX strongly suggests that investors consult a financial advisor prior to making an investment decision.

No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions and conclusions contained in this presentation. To the maximum extent permitted by law, none of VRX, its related bodies corporate, or their shareholders, directors, officers, employees, contractors, agents or advisors, nor any other person accepts any liability, including, without limitation, any liability arising out of fault or negligence for any loss arising from the use of information contained in this document.

This document may include "forward-looking statements" within the meaning of securities laws of applicable jurisdictions. Forward looking statements can generally be identified by the use of the words "anticipate", "believe", "expect", "project", "forecast", "estimate", "likely", "intend", "should", "could", "may", "target", "plan", "guideline", "guidance" and other similar expressions. Indications of, and guidance on, revenue models, pricing, earnings and financial position and performance are also forward-looking statements.

Such forward-looking statements are not guarantees of future pricing, performance and events, and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of VRX, its related bodies corporate, and their directors, officers, employees, contractors, agents and advisors, that may cause actual results to differ materially from those expressed or implied in such statement. Actual results, performance or achievements may vary materially from any projections and forward looking statements and the assumptions on which those statements are based. In particular, potential revenue opportunities and guideline pricing models set out in this document are based on certain assumptions which may in time prove to be false, inaccurate or incorrect. Readers are cautioned not to place undue reliance on forward looking statements and VRX assumes no obligation to update such information.

This document is not, and does not constitute, an offer to sell or the solicitation, invitation or recommendation to purchase any securities in any jurisdiction, and neither this presentation nor anything contained in it forms the basis of any contract or commitment. Without limiting the foregoing, this document does not constitute an offer to sell, or a solicitation of an offer to buy, any securities in the United States. The securities of VRX have not been, and will not be, registered under the U.S. Securities Act of 1933, as amended (Securities Act) or the securities laws of any state or other jurisdiction of the United States, and may not be offered or sold in the United States except in compliance with the registration requirements of the Securities Act and any other applicable securities laws or pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act and any other applicable securities laws.



# Competent Persons Statements

The information in this report that relates to Exploration Results is based on data collected and compiled under the supervision of Mr David Reid, who is a full time employee of VRX Silica. Mr Reid, BSc (Geology), is a registered member of the Australian Institute of Geoscientists and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and the activity being undertaken to qualify as a Competent Person under the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code). Mr Reid consents to the inclusion of the data in the form and context in which it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Mr Grant Louw who is a full-time employee of CSA Global, under the direction and supervision of Dr Andrew Scogings, who is an Associate of CSA Global. Dr Scogings is a Member of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. He is a Registered Professional Geologist in Industrial Minerals. Dr Scogings has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Dr Scogings consents to the disclosure of information in this report in the form and context in which it appears.

The information in this report that relates to the Ore Reserves is based on data collected and compiled under the supervision of Mr David Reid, who is a full time employee of VRX Silica. Mr Reid, BSc (Geology), is a registered member of the Australian Institute of Geoscientists and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and the activity being undertaken to qualify as a Competent Person under the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code). Mr Reid consents to the inclusion of the data in the form and context in which it appears.





**VRX**SILICA

*“Sand is the main material  
that modern cities are made of”*

---

Vince Beiser

“The World in a Grain” 2018

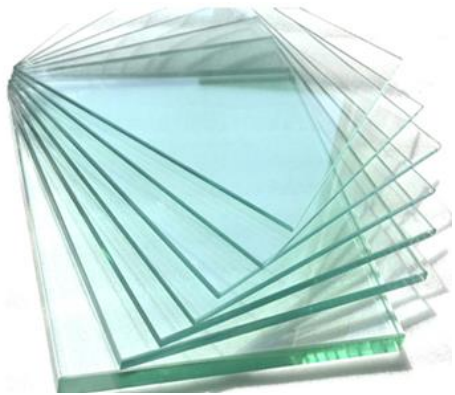
The story of sand and how it  
transformed Civilisation



**VRX**SILICA

# Silica Sand

Silica sand has continued to support human progress throughout history, being a key raw material in the industrial development of the world, especially in the glass, metal casting and ceramics industries.



---

**Supplies of sand are running out!**







# The world is facing a global sand crisis





**VRX**SILICA

# Silica Sand Use

Construction Sand	Concrete
Glassmaking	Flat, Containers, Architectural, Thin Film
Metal Casting/Foundry	Automobile parts
Oil/Gas Well Stimulation	Frac sand/proppant
Metallurgical	Ferrous and Non-ferrous Alloys
Paint and Coatings	Brightness and durability
Chemical Production	Sodium silicate, Silicon gels
Ceramics and Refractories	High temp resistance
Filtration	Water production
Agricultural/Recreational	Inert growing media, Golf bunkers

**Target market**





**VRX**SILICA

*“Sand is the essential ingredient  
that makes modern life possible”*

---

Vince Beiser

“The World in a Grain” 2018



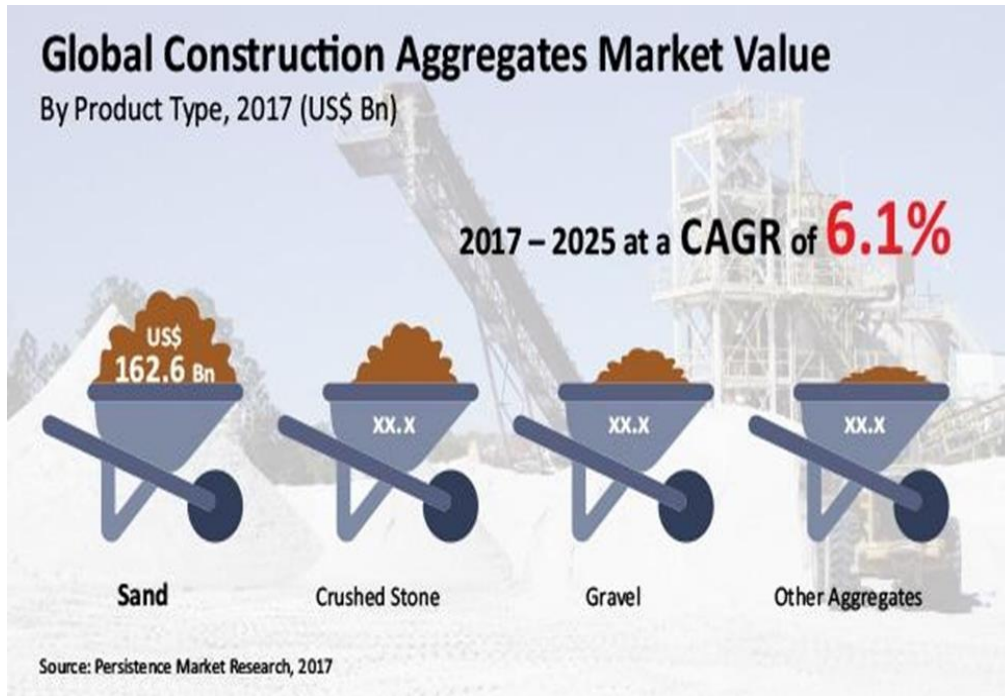


# Construction Market

**VRX**SILICA

China and India will remain major markets for construction materials, mainly due to the growth of the building sector in these two countries.

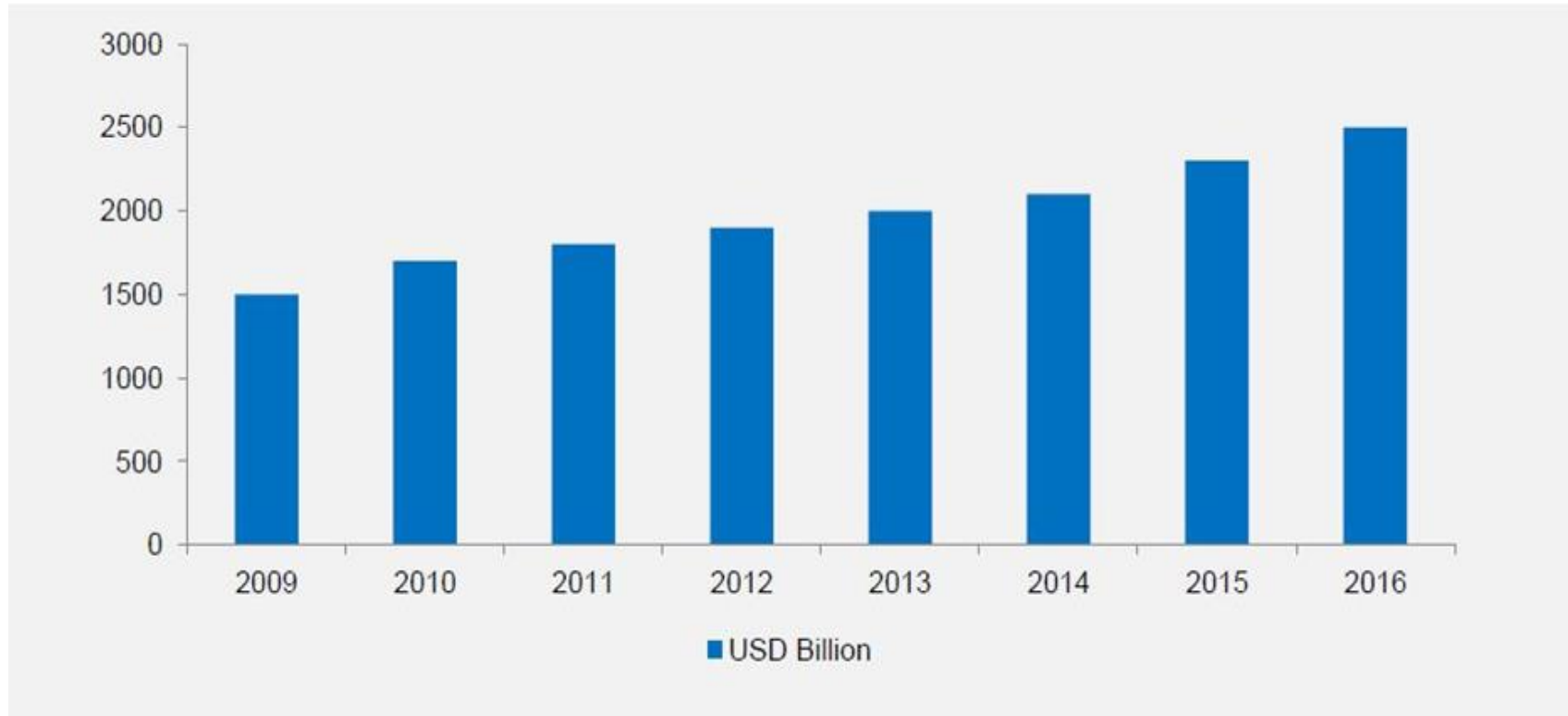
City construction needs glass!





**VRX**SILICA

# Construction Market



---

Total Investment in Infrastructure  
in Asia Pacific

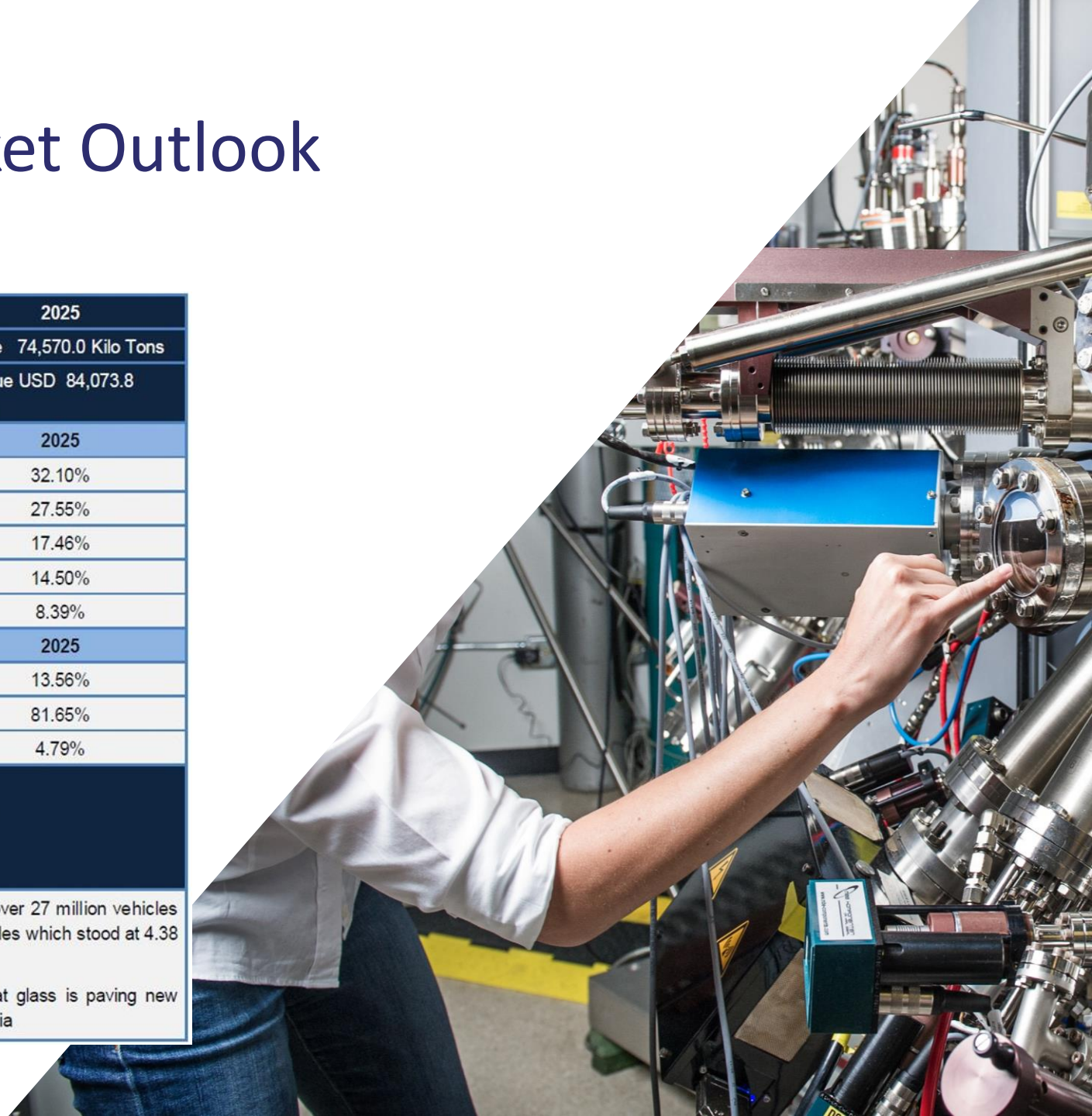




# Flat Glass Market Outlook

**VRXSILICA**

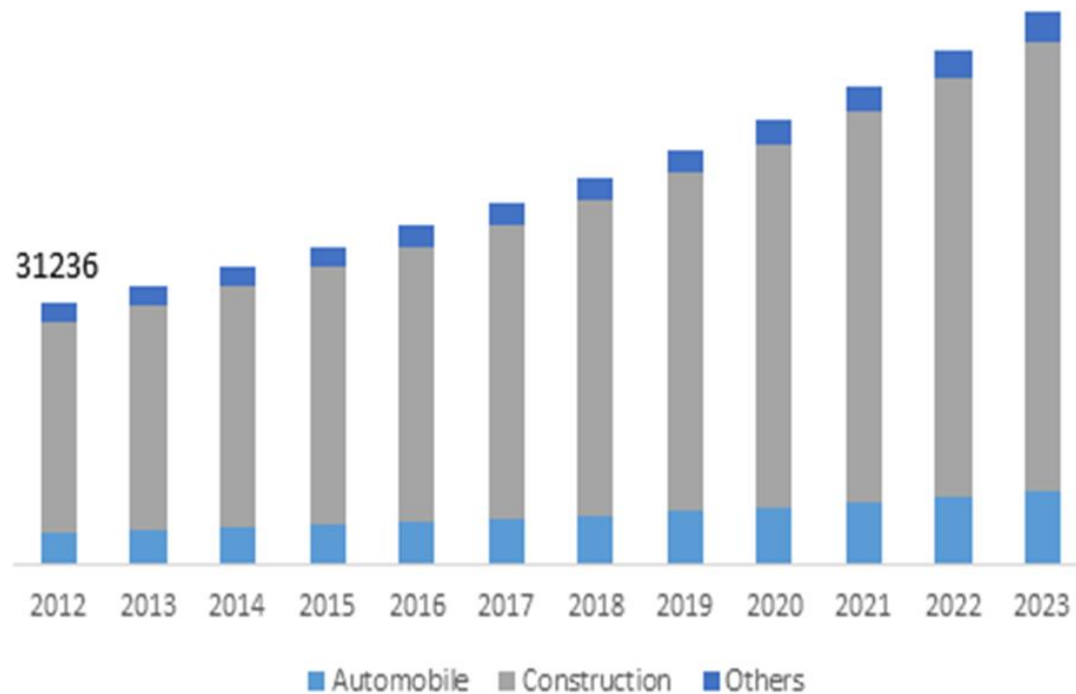
Market size 2014 – 2025 (ASIA PACIFIC)	2014	2018	2025
	Volume 41,639.5 Kilo Tons Revenue USD 40,598.9 Billion	Volume 51,466.7 Kilo Tons Revenue USD 54,420.2 Billion	Volume 74,570.0 Kilo Tons Revenue USD 84,073.8 Billion
Market product size	Product	2018	2025
	Tempered	31.05%	32.10%
	Laminated	26.85%	27.55%
	Basic Float	18.65%	17.46%
	Insulating	13.87%	14.50%
Others	9.58%	8.39%	
Market application size	Application	2018	2025
	Automobile	12.72%	13.56%
	Construction	81.30%	81.65%
Others	5.98%	4.79%	
Market drivers	<ul style="list-style-type: none"> <li>• Growth in building and construction industry in developing countries</li> <li>• Positive automotive industry outlook in Asia Pacific</li> </ul>		
Potential growth opportunities	<ul style="list-style-type: none"> <li>➢ China Association of Automobile Manufacturers, reported a sale of over 27 million vehicles in 2018. This includes a rise of 5.05% in the sale of commercial vehicles which stood at 4.38 million.</li> <li>➢ Solar Energy sector, which is one of the demanding market for flat glass is paving new opportunities for the glass manufacturers particularly in China and India</li> </ul>		





# Flat Glass Market Outlook - China

China Flat Glass Market size, by application, 2013-2023 (Kilo Tons)



The APAC flat glass market is experiencing high growth because of increased demand from the construction and automotive sectors.

The glass industry is a major driver for the global silica sand mining market







**VRX**SILICA

# Chinese Automobile Production



**China produced 27 million vehicles in 2018!**





**VRX**SILICA

*“Humans are estimated to consume nearly 50 billion tons of sand and gravel every year”*

---

“World Construction Aggregates”, 2016







# Glass Innovation

<b>Gorilla Glass</b>	Corning is manufacturing proprietary Gorilla Glass primarily for automobile applications. This glass enables weight reduction in more than 50% of glazing, compared to traditional soda lime glass. This is essential to reduce the weight of an automobile in order to meet strict emissions regulations. Corning manufactures Gorilla glass which is used in windshields, sidelights, backlights, sunroofs, and automotive interior panels.
<b>LCD</b>	Liquid Crystal Displays (LCD) are light modulators that require a light source to be viewed either backlit or lit from an external source. Flat glass is coated with a film which is brushed into a single filament. This technology requires twisted molecular chains, which change the flow of light through the medium to produce on or off pixels.
<b>Thermochromic</b>	Thermochromic Technology modulates the amount of light coming through the glass in response to changing environmental temperatures from sunlight exposure and also changes in wind velocity and air temperature.
<b>ClearVue PV</b>	Australian research company ClearVue PV has been working for years perfecting a technology that utilises clear glass to emulate a solar panel and generate power.
<b>Infoverre</b>	Asahi Glass Company (AGC) is developing a variety of new products for applications that include the infoverre™ WINDOW Series 9mm Clear Screen, encasing a transparent display between multi-paned glazing and can be used to display information.



# VRX's three advanced WA Silica Sand Projects

## Muchea (100%)

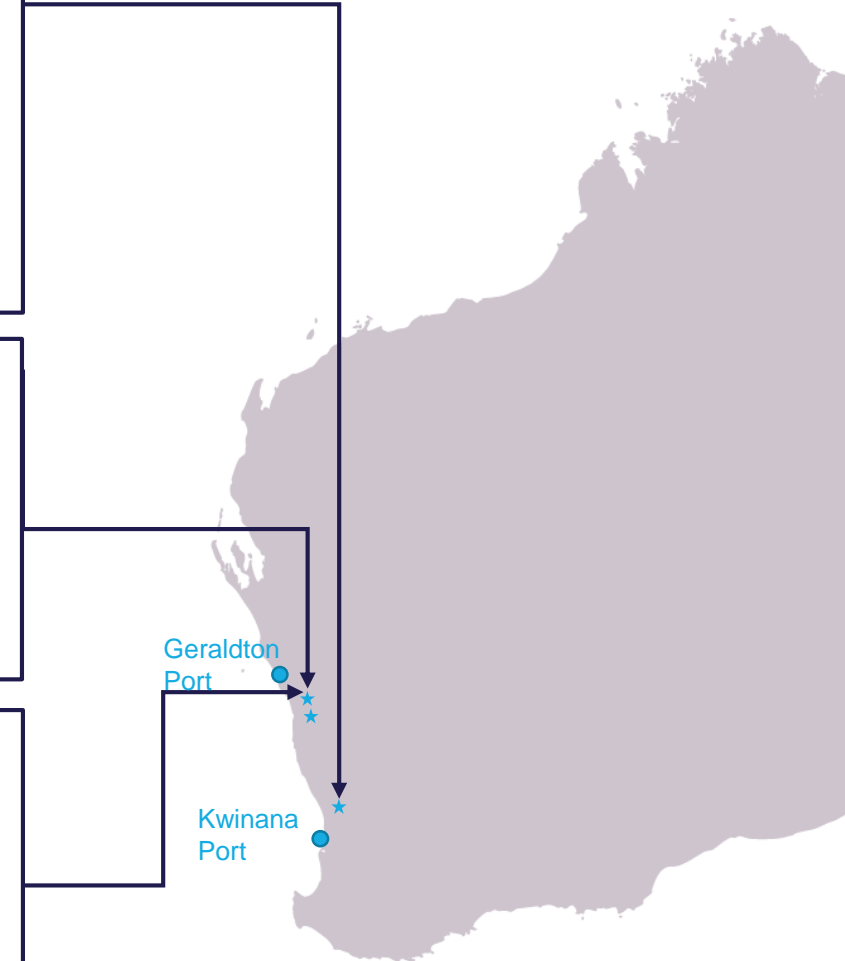
- Very high-grade product with outstanding financial metrics
- Well located to key port and rail infrastructure
- Specialist glass products
- Potential +100 year mine life:
  - JORC Resource **208Mt @ 99.6% SiO<sub>2</sub>**
  - (Ind 29Mt @99.6% SiO<sub>2</sub>; Inf 179Mt @ 99.6% SiO<sub>2</sub>)
  - Probable Ore Reserve of **18.7Mt @ 99.9% SiO<sub>2</sub>**
- BFS completed Oct 2019

## Arrowsmith North (100%)

- High-grade with exceptional financial metrics
- Close proximity to port and rail infrastructure
- Glass making, foundry and ceramic markets
- Potential +100 year mine life:
  - JORC Resource of **771Mt @ 98% SiO<sub>2</sub>**
  - (Ind 248Mt @ 97.7% SiO<sub>2</sub>; Inf 523Mt @ 98.2% SiO<sub>2</sub>)
  - Probable Ore Reserve of **223 Mt @ 99.7% SiO<sub>2</sub>**
- BFS completed Aug 2019

## Arrowsmith Central (100%)

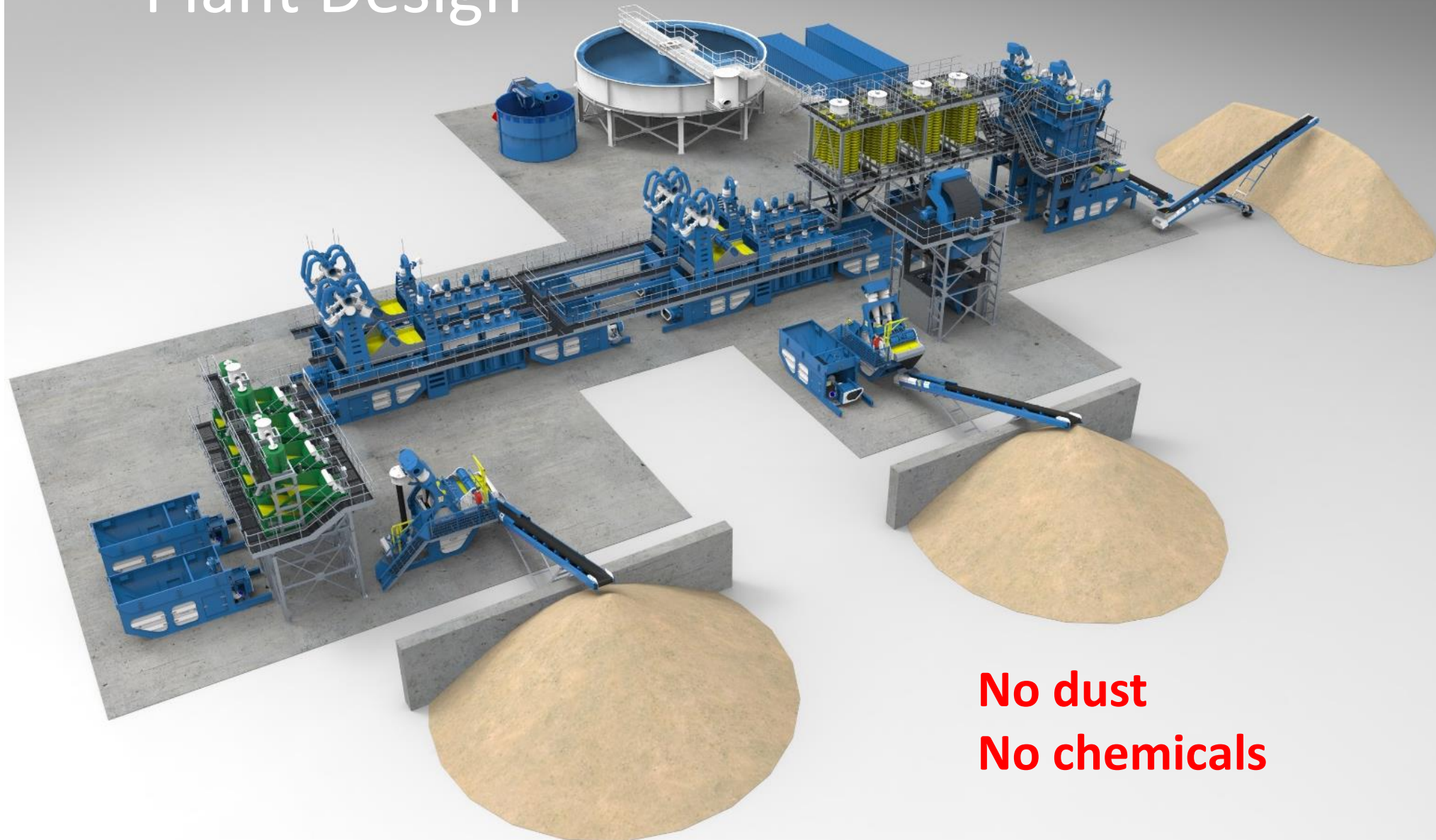
- High grade with strong financial metrics
- Adjacent to rail infrastructure to port
- Container glass and foundry products
- Significant resource base:
  - JORC Resource of **76.5 Mt @ 96.8% SiO<sub>2</sub>**
  - (Ind 28.2Mt @ 96.6% SiO<sub>2</sub>; Inf 48.3Mt @ 96.9% SiO<sub>2</sub>)
  - Probable Ore Reserve of **18.9 Mt @ 99.6% SiO<sub>2</sub>**
- BFS completed September 2019







# Processing Plant Design

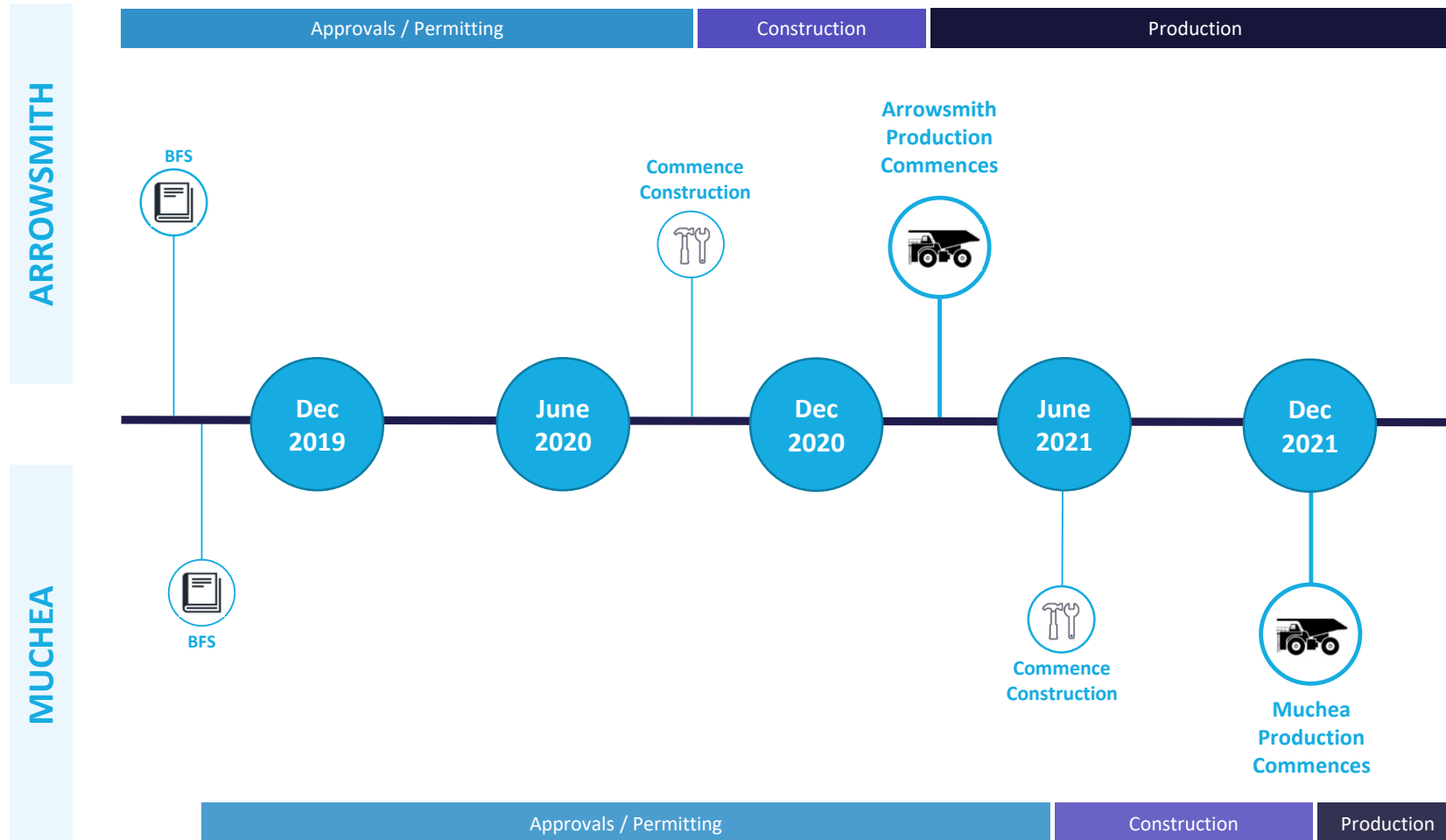


**No dust**  
**No chemicals**



**VRX**SILICA

# Silica Sand Development Timeline





# BFS's Demonstrate Exceptional Economics\*

	Arrowsmith North	Arrowsmith Central	Muchea	Total
Post Tax, ungeared NPV <sub>10</sub>	\$242.3m	\$147.6m	\$337.9m	<b>\$727.8m</b>
Post Tax, ungeared IRR	79%	60%	96%	<b>83%</b>
Payback period (yrs) (post tax) (ramp up rate)	2.4	2.8	2.3	<b>2.4</b>
Exchange Rate US\$/A\$	\$0.70			
Life of Mine (yrs) (BFS Study)	25			
EBIT	\$1.144bn	\$737m	\$1.540bn	<b>\$3.421bn</b>
Total Sales (25 years) no escalation	\$2.773bn	\$2.167m	\$3.345bn	<b>\$8.285bn</b>
Cashflow after finance and tax	\$835m	\$539m	\$1.123bn	<b>\$2.497bn</b>
Capex (2 mtpa)	\$28.260m	\$25.88m	\$32.8m	<b>\$87m</b>
Capex contingency (inc)	20%			
Life of Mine C1 costs, FOB (inc Royalties)	\$30.18	\$27.67	\$32.74	<b>\$30.24</b>
Tonnes Processed (million tonnes) (BFS Study)	53	51	54	<b>158</b>

\* Full details of the bankable feasibility studies for the Arrowsmith North, Arrowsmith Central and Muchea projects, including material assumptions underpinning production targets and forecast financial information, are contained in VRX's ASX announcements of 28 August 2019, 17 September 2019 and 18 October 2019, respectively. All such material assumptions continue to apply and have not materially changed. Whilst VRX considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will be correct or that the range of outcomes indicated within the studies will be achieved.



# Investment Highlights

1. Emerging Australian strategic silica sand producer

---
2. Outstanding project economics and logistics

---
3. Combined NPV<sub>10</sub> after tax \$727m

---
4. Ideally placed to capitalise on robust market outlook and demand

---
5. Rapid pathway to financing and production







# Corporate & Capital Summary

## Capital Structure

Shares On Issue	(m)	445
Options on Issue <sup>1</sup>	(m)	69.5
Share Price	cents	9
Cash (30 Dec)	A\$m	3.9
Debt	A\$m	Nil
Market Capitalisation	A\$m	40

<sup>1</sup> Volume weighted exercise price 10.67 cents

## Directors

Paul Boyatzis	Non-Executive Chairman
Bruce Maluish	Managing Director
Peter Pawlowitsch	Non-Executive Director

## Share Price (12 month)





**VRXSILICA**

# Thank you

---

## **Bruce Maluish**

Managing Director  
Level 1, 6 Thelma Street  
West Perth WA 6005

Phone: 08 9226 3780  
Email: [brucem@vrxsilica.com.au](mailto:brucem@vrxsilica.com.au)