9 July 2019

ASX ANNOUNCEMENT

Arrowsmith North Mineral Resource Estimate Upgrade

Highlights:

- ***Arrowsmith North total Mineral Resource Estimate increased to an outstanding 771 Mt @ 98% SiO_2, an overall increase of 398%***
- ***Resource Estimate includes 248 Mt of Indicated Resource***
- ***Arrowsmith North silica sand Mineral Resource is becoming a world class deposit***
- ***Capable of producing silica sand products suitable for glass making, foundry and ceramics industries***
- ***Mining Reserve estimate and BFS underway***

VRX Silica Limited (**VRX Silica** or **Company**) (ASX: VRX) is pleased to announce the results of a drill program completed at the Arrowsmith North Silica Sand Project (**Arrowsmith North**), located 270km north of Perth, WA.

The drill program was undertaken during March 2019 enabling a new Mineral Resource to be estimated following receipt of analytical results.

The Mineral Resource Estimate for the Arrowsmith North Silica Sand Project has been upgraded to 771 Mt @ 98.0% SiO_2 including an Indicated Resource estimate of 248 Mt @ 97.7% SiO_2 and an Inferred Resource estimate of 523 Mt @ 98.2% SiO_2. All Mineral Resources are reported in accordance with the JORC Code 2012 (see Table 1).

VRX Silica Managing Director Bruce Maluish said: *"Significantly the Mineral Resource includes an unpredicted 313 million tonnes of white sand at 98.7% silica. A high-grade final product can be produced from the higher-grade feed stock which is in demand for the foundry and glassmaking industries."*

"This Mineral Resource estimation will now allow the Company to finalise estimates of Ore Reserves which will support the impending BFS," said Maluish.

The Indicated Mineral Resource is predominately within the Mining Lease application area and the majority is anticipated to convert to Probable Reserves and hence an extremely long-life mining project.

No more drilling is required before the Company will commence mining operations. However, the Company will undertake a further testwork program on the white sand.

Work is ongoing to complete the process for the Mining Lease Applications and Environmental Approvals at both the Arrowsmith North and Arrowsmith Central Silica Sand Projects.

ASX: VRX

Capital Structure

Shares on Issue: 404 million

Top 20: 47%

Unlisted Options: 72 million

Corporate Directory

Paul Boyatzis
Non-Executive Chairman

Bruce Maluish
Managing Director

Peter Pawlowitsch
Non-Executive Director

John Geary
Company Secretary

Company Projects

Arrowsmith Silica Sand Project, 270km north of Perth, WA.

Muchea Silica Sand Project, 50km north of Perth, WA.

Boyatup Silica Sand Project, 100km east of Esperance, WA.

Warrawanda HPQ Project south of Newman, WA.

Biranup base metals and gold Project adjacent to the Tropicana Gold Mine, WA.

The Company is actively assessing other silica sand projects in Australia.

VRX Silica Limited
A Level 1, 6 Thelma St, West Perth WA 6005 Australia • PO Box 1925, West Perth WA 6872 Australia • ABN 59 142 014 873
P +61 8 9226 3780 • E info@vrxsilica.com.au • W vrxsilica.com.au

Detailed Information

The information in this announcement refers to the Arrowsmith North silica sand project, which is located north of Eneabba, 270km north of Perth in Western Australia, Figure 1.

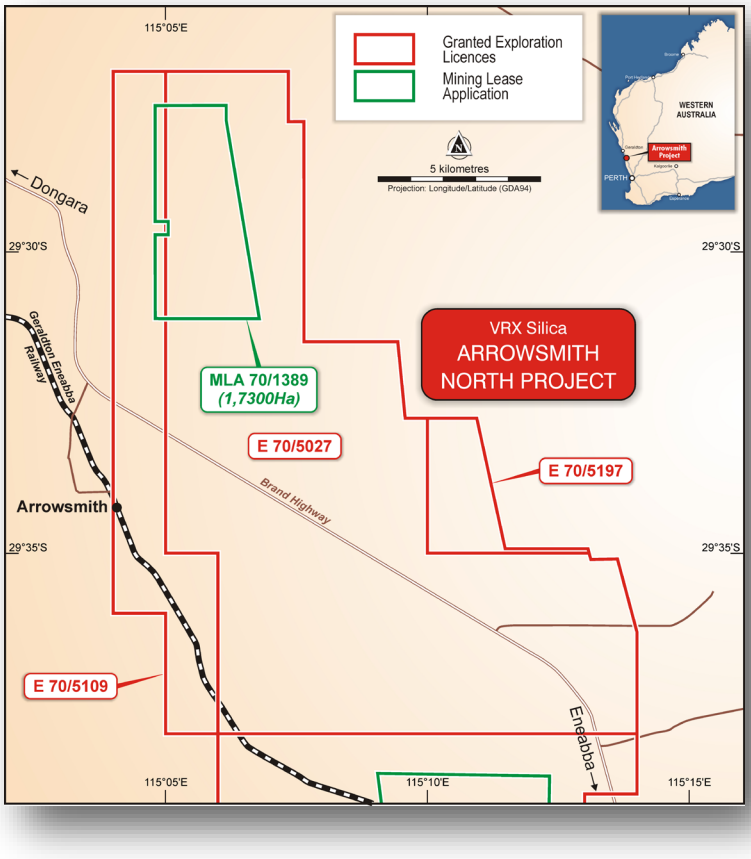


Figure 1: Arrowsmith North Project Location

VRX Silica had previously reported a maiden Mineral Resource Estimate (**MRE**) for Arrowsmith North.[1]

During March 2019 VRX Silica commenced an aircore drill program over the area previously only tested by shallow hand auger drilling.[2] The results of that program for Arrowsmith North are now available and have been used to update the MRE for the Arrowsmith North Project and to declare a maiden Indicated Mineral Resource. The estimation of an Indicated Mineral Resource will allow for a Mining Reserve to be estimated once a positive Feasibility Study is completed.

The July 2019 MRE has estimated an **Indicated Mineral Resource** of **248 Mt @ 97.7% SiO_2** in addition to an **Inferred Mineral Resource** of **523 Mt @ 98.2% SiO_2** for a **Total MRE** of **771 Mt @ 98.0% SiO_2**, an overall increase of **398% on the maiden estimate**, see Tables 1 and 2 below.

[1] ASX announcement of 2 October 2018, "Arrowsmith North Maiden Mineral Resource".
[2] ASX announcement of 13 March 2019, "*Drilling at Muchea and Arrowsmith Silica Sand Projects*".

The MRE is wholly within granted tenements E70/5109 and E70/5027 which are 100% owned by VRX Silica. This MRE update is based on the results of the most recent drilling, with the initial hand auger drilling being used to assist in the model estimation. The model defines two different sand types, "Yellow" and "White" sand (Tables 1 and 2), which are different with respect to their chemistry and particle size distribution.

The Arrowsmith Project area has a mining depth limitation to be above the water table which is 10 metres below the drilling. The MRE has been estimated to a nominal depth well above the water table and the top half metre of topsoil has been discounted in the MRE as it will be used for rehabilitation.

Metallurgical testwork completed to-date confirms this updated silica sand model is considered readily amenable to upgrading by conventional washing and screening methods to produce a high-purity silica sand product with high mass recoveries. The high-purity silica sand product specifications are expected to be suitable for industries such as the glass making, foundry and ceramics industries.

Figure 1 below shows the drill coverage over the tenements with the underlying sand types shown. The Arrowsmith North Target Area defines the area to which the MRE is constrained and represents the area where there are no current restrictions to mining.

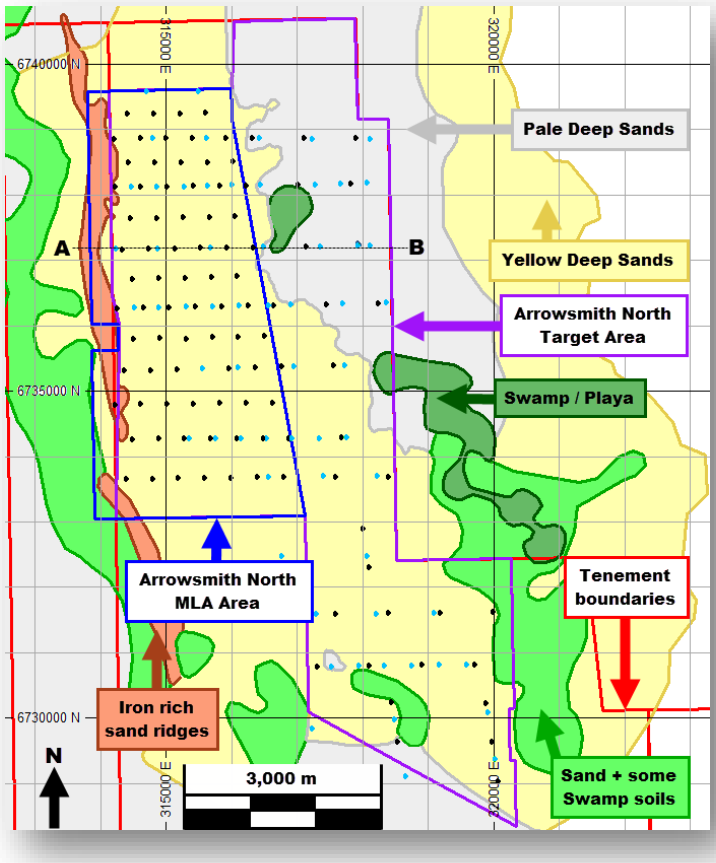


Figure 2: Arrowsmith North Project schematic geology map showing MRE with separate drill type, Black dots = aircore, Blue dots = auger

The MRE results are shown in Table 1, and a plan showing the resource areas and classification is shown in Figure 2. Summary information is included in this report and JORC Code 2012 Table 1 is included as Appendix 1.

Classification	Domain	Million Tonnes	SiO_2%	Al_2O_3%	Fe_2O_3%	TiO_2%	LOI%
Indicated	White Sand	33	98.7	0.50	0.20	0.20	0.20
	Yellow Sand	215	97.5	1.10	0.40	0.20	0.50
	All Sand	**248**	97.7	1.00	0.40	0.20	0.50
Inferred	White Sand	280	98.7	0.50	0.10	0.20	0.20
	Yellow Sand	243	97.7	1.00	0.40	0.20	0.50
	All Sand	**523**	98.2	0.80	0.30	0.20	0.40
Indicated + Inferred	White Sand	313	98.7	0.54	0.15	0.18	0.24
	Yellow Sand	458	97.6	1.08	0.40	0.17	0.52
	All Sand	**771**	**98.0**	**0.86**	**0.30**	**0.17**	**0.41**

**Note: Interpreted silica sand mineralisation is domained above a basal surface wireframe defined based on drill logging data. The upper (Topsoil) layer within 0.5 m of surface is depleted from the modelled silica sand unit, being reserved for rehabilitation purposes. All classified silica sand blocks in the model are reported. Differences may occur due to rounding.*

Table 1: Arrowsmith North Silica Sand Mineral Resource Estimate as at July 2019

Classification	Domain	Maiden MRE (Mt)	Updated MRE (Mt)	Difference
Indicated	White Sand		33	
	Yellow Sand		215	
	All Sand		**248**	
Inferred	White Sand	44	280	633%
	Yellow Sand	149	243	163%
	All Sand	194	523	270%
Indicated + Inferred	White Sand	44	313	708%
	Yellow Sand	149	458	307%
	All Sand	**194**	**771**	**398%**

Table 2: Tonnage Comparison with Prior estimate

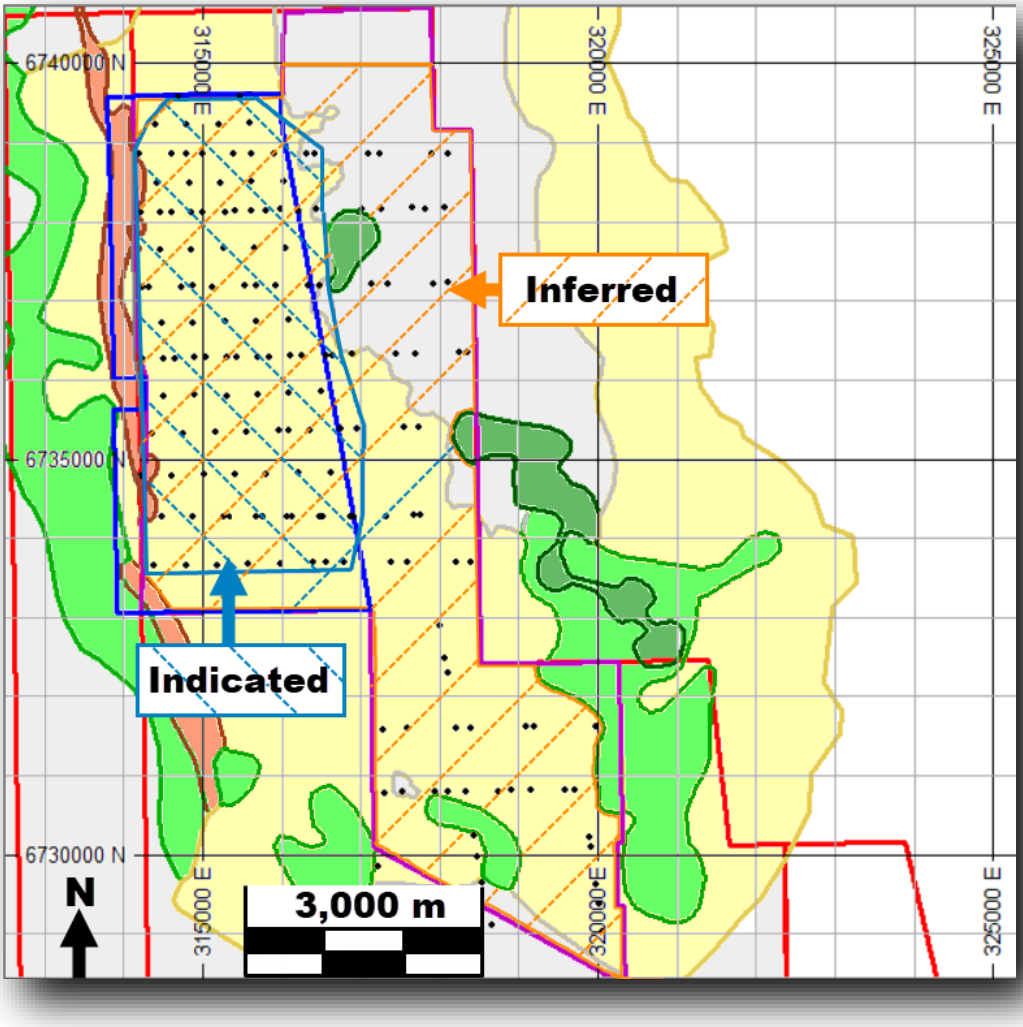


Figure 3: Arrowsmith North Updated MRE by classification.

COMPETENT PERSONS' STATEMENTS

The information in this announcement that relates to Arrowsmith Exploration Results are based on data collected and compiled under the supervision of Mr David Reid, in his capacity as Exploration Manager. 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". Mr Reid consents to the inclusion of the data in the form and context in which it appears.

The information in this announcement that relates to Arrowsmith North 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.

ASX LISTING RULE 5.8.1 SUMMARY

The following summary presents a fair and balanced representation of the information contained within the Mineral Resource Estimate (MRE) technical report:

- Silica sand mineralisation at Arrowsmith North occurs within the coastal regions of the Perth Basin, and the targeted silica sand deposits are the aeolian sand dunes that overlie the Pleistocene limestones and paleo-coastline. (ASX LR 5.8.1 geology & geological interpretation).
- Samples were obtained from auger drilling and air core drilling. Quality of drilling/sampling and analysis, as assessed by the Competent Person, is of an acceptable standard for use in a Mineral Resource estimate publicly reported in accordance with the JORC Code. (ASX LR 5.8.1 Sampling & 5.8.1 Drilling).
- Major and trace elements apart from SiO_2 were analysed using a four-acid digest followed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry (ICP-OES) analysis at the Intertek Genalysis, Perth laboratory. Loss on Ignition at 1000°C (LOI) was analysed by Thermal Gravimetric Analyser. SiO_2 was back-calculated by subtracting all ICP major and trace elements plus LOI from 100%, as this is the most accurate way of determining SiO_2 content for samples with very high SiO_2. Certain of the ICP results were verified by X-Ray Fluorescence (XRF) analyses. (ASX LR 5.8.1 Analysis).
- The Mineral Resources were estimated above 3-d wireframe basal surfaces for the white and yellow sands, with the surfaces being based on the geological boundaries defined by logged sand types and chemical analysis results from the drill data. The air core drilling demonstrated that the white sand layer extends to the west, past the interpreted contact, under the yellow sand in approximately the northern half of the modelled area. The basal surface of the yellow sand is defined by this lithological contact, or is limited by interpretation of nominal average thickness of the sand layer based on the data from surrounding deeper drill holes as required. The white sand layer basal surface is similarly defined by the drilling data and or is limited by interpretation of nominal average thickness of the sand layer based on data from surrounding deeper drill holes as required. The horizontal extents of the interpreted sand layers are limited to within the VRX nominated Arrowsmith North target area and with reference to the publicly available soil mapping data. The surface humus layer is typically about 300 mm thick. In consultation with the Company, CSA Global considered that the upper 500 mm (overburden) is likely to be reserved for rehabilitation purposes. This overburden surface forms the upper boundary of the estimated Mineral Resource and is depleted from the reported Mineral Resources. Comparatively minor areas that are mapped as iron richer sand ridges, swamp or sandy swamp are also depleted from the Mineral Resources. (ASX LR 5.8.1 Estimation methodology).
- Grade estimation was completed using ordinary kriging with an inverse distance weighting to the power of two validation estimate also completed. (ASX LR 5.8.1 Estimation methodology).

- The Mineral Resource is quoted from all classified blocks within the defined layers for white and yellow sand and below the overburden surface layer. (ASX LR 5.8.1 cut-off grades).
- The Mineral Resource was classified as Indicated and Inferred based on drill hole logging, drill hole sample analytical results, drill spacing, geostatistical analysis, confidence in geological continuity, and metallurgical / process test results. (ASX LR 5.8.1 classification).
- Roughly 15% of the interpreted mineralisation is extrapolated.
- The JORC Code Clause 49 requires that industrial minerals must be reported "in terms of the mineral or minerals on which the project is to be based and must include the specification of those minerals" and that "It may be necessary, prior to the reporting of a Mineral Resource or Ore Reserve, to take particular account of certain key characteristics or qualities such as likely product specifications, proximity to markets and general product marketability." (ASX LR 5.8.1 Mining, metallurgy & economic modifying factors).
- Therefore, the likelihood of eventual economic extraction was considered in terms of possible open pit mining, likely product specifications, possible product marketability and potentially favourable logistics and it is concluded that Arrowsmith North is an industrial mineral Mineral Resource in terms of Clause 49. (ASX LR 5.8.1 Mining, metallurgy & economic modifying factors)

Testwork and Product Catalogue

VRX has announced the results of metallurgical testwork and the development of product catalogues. [3] The testwork completed to date at the CDE Global, world leading sand testing laboratory in Cookstown, Northern Ireland confirmed that high quality glass and foundry sand could be produced from the Arrowsmith North Project. This testwork resulted in the generation of a catalogue of products that can be produced from the Arrowsmith North Project, these are summarised in Table 3 and 4, below.

Chemical Composition (%)

Product	Type	SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	K_2O
Arrowsmith-NF500	Glass	99.7	0.20	0.05	0.035	0.010	0.002	0.03
Arrowsmith-N20	Foundry	99.7	0.20	0.05	0.035	0.010	0.002	0.03
Arrowsmith-N40	Foundry	99.7	0.20	0.05	0.035	0.010	0.002	0.03

Table 3: Arrowsmith North Product Catalogue – Chemical Composition

Particle Size	Sieve Opening – Mesh (µm) Retained									
Product	10 (2000)	20 (850)	30 (600)	40 (425)	50 (300)	70 (212)	100 (150)	140 (106)	200 (75)	AFS No
Arrowsmith-NF500			0.5%	40%	42%	17%	1%	0%		
Arrowsmith-N20	0.1%	3%	87%	8%	1%	0.1%				21
Arrowsmith-N40		0%	21%	36%	24%	13%	5%	1%	0%	36

Table 4: Arrowsmith North Product Catalogue – Particle Size

[3] ASX announcement of 26 February 2019. "Testwork Update and Product Catalogues".

Plant Recoveries

VRX has announced the process plant recoveries for each of the Arrowsmith North products reported in the catalogue. [4]

Product	Industry	Recovery
Arrowsmith - N20	Foundry	24%
Arrowsmith - N40 / NF500	Foundry / Glass	60%
Local Market/Filter/Bunker	Filter / Bunker	6%

Table 5: Arrowsmith North Plant Recoveries

Future Work

With the estimation of an Indicated Mineral Resource the Company can now complete a Feasibility Study and estimate an Ore Reserve for the Project. A positive Feasibility Study will allow for the project to progress through mining approvals, financing and into construction and the commencement of Mining Operations.

A further testwork program will be undertaken on the unpredicted 313 million tonnes of white sand at Arrowsmith North to determine the quality of products that can be generated from the higher-grade source.

For silica sand enquiries contact Mr Yoonil Kim:

Manager International Sales

yoonilk@vrxsilica.com.au

+60 17 687 8238

Further information:

Bruce Maluish
Managing Director
brucem@vrxsilica.com.au
0418 940 417

Andrew Rowell
Cannings Purple
arowell@canningspurple.com.au
0400 466 226

[4] ASX announcement of 3 May 2019, "High Recovery from Silica Sand Process Plant Design-Amended".

About VRX Silica

VRX Silica Ltd (VRX Silica) (ASX: VRX) has significant silica sand projects in Western Australia.

The Arrowsmith Silica Sand Project, located 270kms north of Perth, comprises five granted exploration licences and two mining lease applications pending. The Muchea Silica Sand Project, located 50kms north of Perth, comprises one granted exploration licence, with one exploration licence and one mining lease application pending. Testwork has confirmed a range of silica sand products which are capable of production at both projects. A feasibility study for Arrowsmith Central and Arrowsmith North is being compiled.

The Boyatup Silica Sand Project, located 100kms east of Esperance, comprises two adjacent granted exploration licences. Initial indications are that this project will complement both Arrowsmith and Arrowsmith while adding to the silica products VRX Silica will potentially produce. A POW for a drilling program has been approved and the Company is currently arranging a Heritage Survey for drilling clearance.

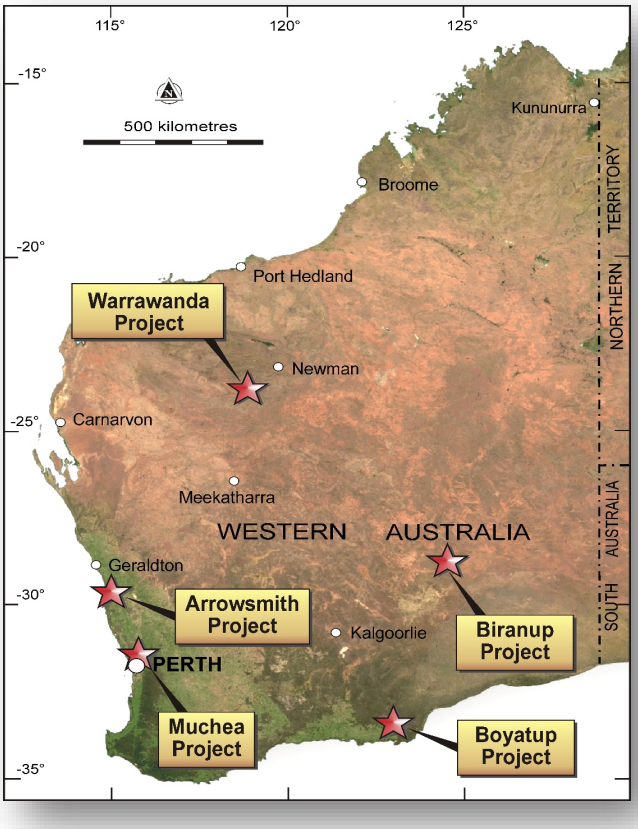
Also, in Western Australia, 40km south of Newman, is VRX Silica's Warrawanda Project, which is prospective for high purity quartz and nickel sulphides. A POW for a drilling program has been approved and the Company is currently arranging a Heritage Survey for a drilling clearance.

VRX Silica also has granted tenements at its Biranup Project, adjacent to the Tropicana Gold Mine in Western Australia's Goldfields that are prospective for gold and base metals.

Proven Management

The VRX Silica Board and management team have extensive experience in mineral exploration and mine development into production and in the management of publicly listed mining and exploration companies.

Project Locations



Appendix 1 - JORC 2012 Table 1 Report

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	Commentary
Sampling techniques	Aircore drilling samples are 1m down hole intervals with sand collected from a cyclone mounted rotary cone splitter, ~2-3kg (representing 50% of the drilled sand) was collected. Two sub-samples, A and B, of ~200g were taken from the drill samples. The remainder was retained for metallurgical testwork. Auger drilling samples are 1m down hole intervals with sand collected from a plastic tub which received the full sample, ~8kg, from the hole. The sand was homogenised prior to sub sampling, two sub-samples, A and B, of ~200g were taken from the drill samples. A bulk sample of ~5kg was retained for each 1m interval for metallurgical testwork. The "A" sample was submitted to the Intertek Laboratory in Maddington, Perth for drying, splitting (if required), pulverisation in a zircon bowl and a specialised silica sand 4 Acid digest and ICP analysis. All auger samples were weighed to determine if down hole collapse was occurring, if the samples weights increased significantly the hole was terminated to avoid up hole contamination. The targeted mineralisation is unconsolidated silica sand dunes, the sampling techniques are "industry standard". Due to the visual nature of the material, geological logging of the drill material is the primary method of identifying mineralisation.
Drilling techniques	Vertical NQ sized aircore drilling was completed by a Contract Drilling Company using a Landcruiser mounted Mantis 82 drill rig. A 100mm diameter hand screw auger was used to drill until hole collapse.
Drill sample recovery	Aircore Visual assessment and logging of sample recovery and sample quality Reaming of hole and clearance of drill string after every 3m drill rod Sample splitter and cyclone cleaned regularly to prevent sample contamination No relationship is evident between sample recovery and grade Hand Auger All material recovered from the hole is collected in a plastic drum and weighed, the weights are used to determine when the hole is collapsing, and drilling is terminated. No relationship is evident between sample recovery and grade
Logging	Geological logging of drill samples is done by the field geologist with samples retained in chip trays for later interpretation. Logging is captured in an excel spreadsheet, validated and uploaded into an Access database
Sub-sampling techniques and sample preparation	Aircore drill samples are rotary split 50:50 into a calico bag resulting in 2-3kg of dry sample, 2 x 200g sub-samples, A and B, are taken from the drill sample. The A sample is submitted to the laboratory and the B sample is retained for repeat analysis and QA/QC purposes. The bulk sample is retained for later metallurgical testwork.

Criteria	Commentary
	Auger drill material, ~8kg, is collected in a plastic tub and homogenised, 2 x 200g sub-samples, A and B, are taken from the drill material. The A sample is submitted to the laboratory and the B sample is retained for repeat analysis and QAQC purposes. A 5kg bulk sample is retained for later metallurgical testwork. The sample size is considered appropriate for the material sampled. The 200g samples are submitted to the Intertek Laboratory in Maddington, Intertek use a zircon bowl pulveriser to reduce the particle size to -75um.
Quality of assay data and laboratory tests	Samples were submitted for analysis to the Intertek Laboratory in Maddington in Perth WA. The assay methods used by Intertek are as follows: multi-elements are determined by a specialised four-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon tubes. Analysed by Inductively Coupled Plasma Mass Spectrometry, silica is reported by difference. The assay results have also undergone internal laboratory QAQC, which includes the analysis of standards, blanks and repeat measurements. The Company has been validating a high-purity silica standard that was created for the Company by OREAS Pty Ltd. This was required as there is no commercial standard available for high purity silica sand. The standard was "round robin" assayed at several laboratory's in Perth prior to the commencement of drilling. The standard was then included in the drill sample submissions to Intertek, in sequence, on a ratio of 1:20. Field duplicate samples were submitted in a ratio of 1:20 and in addition to this Intertek routinely duplicated analysis from the pulverised samples in a ratio of 1:25. The number of QAQC samples therefore represents ~14% of the total assays. A full analysis of all the quality control data has been undertaken. This analysis validates the drill assay dataset and conforms with the guidelines for reporting under the JORC 2012 code.
Verification of sampling and assaying	Significant intersections validated against geological logging Three pairs of twin holes were drilled at Arrowsmith North, with each twin pair collared within 0.5m. Analysis of the twin pairs shows an acceptable repeatability between holes.
Location of data points	Auger drill hole locations were measured by hand-held GPS with the expected relative accuracy; GDA94 MGA Zone 50 grid coordinate system is used. Aircore drill holes have been surveyed by RM Surveys using base stations on GOLA SSM DON53 and a Project Control point established as GFM001, situated within the Arrowsmith North prospect and coordinated by RTK from DON53, with the expected relative accuracy compared to the control of 0.05m E, N and RL. Due to RL issues with the SRTM topographical surface the drill collar RL's were transformed to the SRTM surface.
Data spacing and distribution	Initial auger drilling at Arrowsmith were spaced 400-1,000m apart along existing tracks. The aircore drilling in the indicated resource was spaced 400m, along lines spaced 450m apart. In the Inferred area holes were spaces 800m apart, on line spaces 800m apart. No sample compositing (down hole) has been done.
Orientation of data in relation to geological structure	Sampling is being undertaken on aeolian sand dunes; the drill orientation is therefore considered appropriate.
Sample security	All samples are selected onsite under the supervision of VRX Silica Geological staff.

Criteria	Commentary
	Samples are delivered to the Intertek laboratory in Maddington. Intertek receipt received samples against the sample dispatch documents and issued a reconciliation report for every sample batch.
Audits or reviews	There has been no audit or review of sampling techniques and data at this time.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	Commentary
Mineral tenement and land tenure status	All drilling has been within Tenement E70/5027, which is owned by Ventnor Mining Pty Ltd a 100% owned subsidiary of VRX Silica Limited. The tenement was granted 29 August 2017 and all drilling was conducted on VCL.
Exploration done by other parties	Minor exploration for mineral sands has been completed by various Companies. Other than work completed by VRX, no exploration for silica sand has been done.
Geology	Most economically significant silica sand deposits in Western Australia are found in the coastal regions of the Perth Basin, and the targeted silica sand deposits are the aeolian sand dunes that overlie the Pleistocene limestones and paleo-coastline, which also host the regional heavy mineral deposits. Within the project area, data obtained from the Department of Agriculture soil mapping shows there are pale and yellow deep sands predominating with lesser swampy areas and occasional ironstone ridges.
Drill hole Information	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3). Sample and drillhole coordinates are provided in previous market announcements.
Data aggregation methods	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Relationship between mineralisation widths and intercept lengths	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Diagrams	Refer to figures within the main body of this report.
Balanced reporting	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Other substantive exploration data	Geological observations are consistent with aeolian dune mineralisation Four, certified, dry in-situ bulk density measurements were completed at Arrowsmith by Construction Sciences Pty Ltd using a nuclear densometer. The arithmetic average of these was used in the determination of the exploration targets. Groundwater was intersected in only a few holes that were drilled deeper deliberately to ascertain the position of the water table. The water table is typically below 15m depth. The mineralisation is unconsolidated sand. There are no known deleterious substances at this time.
Further work	With the estimation of an Indicated Mineral Resource the Company can now complete a Feasibility Study and estimate a Ore Reserve for the Project. A positive Feasibility Study

Criteria	Commentary
	will allow for the project to progress through mining approvals, financing and into construction and the commencement of Operations. A further testwork program will be undertaken on the "White Sand" at Arrowsmith North to determine the products that can be beneficiated from the higher-grade source.

Section 3: Estimation and Reporting of Mineral Resources

(Criteria listed in the preceding section also apply to this section.)

Criteria	Commentary
Database integrity	Data used in the MRE is sourced from a Microsoft Access database. Relevant tables from the Microsoft Access database are exported to Microsoft Excel format and converted to csv format for import into Datamine Studio 3 software. Validation of the data imported comprises checks for overlapping intervals, missing survey data, missing analytical data, missing lithological data, and missing collars.
Site visits	A site visit by Grant Louw of CSA Global took place on 3 July 2019. Geology – Mr Louw noted that the Arrowsmith tenements are primarily underlain by unconsolidated white / yellow silica sand, covered by low scrub and very few trees. Topographic relief is low. It was noted that the material recorded as ironstone ridges by the DOAG mapping is in fact a more iron rich sand unit, and not an ironstone. Drill collars – Mr Louw recorded and verified several marked drill sites using hand-held GPS. Project location – several points such as road intersections were located and plotted in Google Earth™ to verify the tenement location. The CP has visited the VRX sample storage on 17 October 2018 and addressed the following: Sample storage – originals, field duplicates, pulps, standards and chip trays are housed appropriately. Some chip trays were photographed by the CP as a check against Company photographs and geology logs.
Geological interpretation	Silica sand mineralisation at Arrowsmith North occurs within the coastal regions of the Perth Basin, and the targeted silica sand deposits are the aeolian sand dunes that overlie the Pleistocene limestones and paleo-coastline. Within the project area, data obtained from the Department of Agriculture soil mapping shows there are pale (logged by the Company as white sands) and yellow deep sands predominating, with lesser swampy areas and occasional iron rich sand ridges. The geological modelling was completed based on this soil mapping data in conjunction with the auger and aircore drill logging data. The Mineral Resources were estimated above 3-d wireframe basal surfaces for the white and yellow sands, with the surfaces being based on the geological boundaries defined by logged sand types and chemical analysis results from the drill data. The air core drilling demonstrated that the white sand layer extends to the west, past the interpreted contact, under the yellow sand in approximately the northern half of the modelled area. The basal surface of the yellow sand is defined by this lithological contact, or is limited by interpretation of nominal average thickness of the sand layer based on the data from surrounding deeper drill holes as required. The white sand layer basal surface is similarly defined by the drilling data and or is limited by interpretation of nominal average thickness of the sand layer based on data from surrounding deeper drill holes as required. The horizontal extents of the interpreted sand layers are limited to within the VRX

Criteria	Commentary
	Silica nominated Arrowsmith North target area and with reference to the publicly available soil mapping data. The surface humus layer is typically about 300 mm thick. In consultation with VRX Silica, CSA Global considered that the upper 500 mm (overburden) is likely to be reserved for rehabilitation purposes. This overburden surface forms the upper boundary of the estimated Mineral Resource and is depleted from the reported Mineral Resources. Comparatively minor areas that are mapped as iron richer sand ridges, swamp or sandy swamp are also depleted from the Mineral Resources Despite both white and yellow sands being readily amenable to beneficiation, they have been separately modelled, based on the drill logging data and mapped soil type boundaries, as they are separately estimated due to differences in grades of the various mineral components. Assumptions have been made on the horizontal extents of the mineralisation based on the soil mapping data and the spacing and extents of the drilling information. A nominal maximum horizontal extrapolation limit of 200 m past known drill data points has been applied with the material types additionally constrained within the VRX Silica nominated target area and by the mapped material type boundaries. The vertical extents of the sand layers have been limited by interpretation of the nominal average thickness of each layer based on data from the deeper drilled aircore holes. The nominal maximum interpreted combined layer sand vertical thickness is roughly 25 m and the nominal average interpreted thickness of sand is about 12 m. Approximately 15% of the modelled mineralisation zones can be considered to be extrapolated. Alternative interpretations based on the currently available data are considered unlikely to have a significant influence on the global MRE. Continuity of geology and grade can be identified and traced between drillholes by visual and geochemical characteristics. Confidence in the grade and geological continuity is reflected in the Mineral Resource classification.
Dimensions	The modelled and classified extents of the yellow sand material within the target area are roughly 10 km north to south, and on average roughly 2.5 km west to east. The modelled and classified extents of the white sand material within the target area are roughly 4.6 km north to south, and on average roughly 1.5 km west to east. The modelled aeolian sand is roughly horizontal, with low relief. The currently modelled thickness of the sands is on average about 12 m, ranging up to a nominal maximum thickness of 25 m.
Estimation and modelling techniques	Ordinary Kriging (OK) was the selected interpolation method, with Inverse distance squared (IDS) used as a check estimate. Grade estimation was carried out at the parent cell scale, with sub-blocks assigned parent block grades. Grade estimation was carried out using hard boundaries between the two sand type zones. Statistical analysis on the 1 m downhole composited drillhole data to check grade population distributions using histograms, probability plots and summary statistics and the co-efficient of variation, was completed on each sand type for the estimated grade variables. The checks showed there were some outlier grades in the interpreted sand types that required top-cutting. Top cuts for the white sand were applied to Fe2O3 (0.5%), and LOI (1%). Top cuts for the yellow sand were applied to Al2O3 (2.8%), Fe2O3 (1.5%), and LOI (1.5%).

Criteria	Commentary
	In addition to SiO2, the grade variables Al2O3, Fe2O3, LOI, and TiO2 are estimated into the model and reported. A volume block model was constructed in Datamine constrained by the topography, overburden layer, sand type zones, material depletion zones and target area limiting wireframes. Analysis of the drill spacing shows that the nominal average drill section spacing is 400 m with drill holes nominally at 400 m apart on each section over majority of the modelled area. Spatial (variogram) analysis was completed on SiO2 from the 1 m drill composite samples from the yellow sand zone, as this zone has the most samples. The resultant single spherical modelled variogram parameters were applied to an OK estimation as the primary grade estimation technique. The modelled nugget was a fairly low 15%. There was no preferred orientation for the horizontal variogram so the major axis is modelled towards 000° with the same 700 m range modelled for both major and semi-major axes. The minor vertical axis was modelled with a range of 8.5 m. Based on the sample spacing a parent block size of 200 m(E) x 200 m(N) x 4 m(RL) or nominally half the average drill section spacing, was selected for the model. Sub-cells down to 12.5 m(E) x 25 m(N) x 0.25 m(RL) were used to honour the geometric shapes of the modelled mineralisation. The search ellipse orientations were defined as being horizontal based on the overall geometry of the mineralisation and with reference to the variogram modelling study. The search ellipse was doubled for the second search volume and then increased ten-fold for the third search volume to ensure all blocks found sufficient samples to be estimated. The search ellipse dimensions of 700 m x 700 m x 10 m, have been selected with reference to the variogram modelling. A minimum of 16 and a maximum of 24 samples were used to estimate each parent block for both zones. These numbers were reduced for the second search volume to 12 and 20 samples and in the third search volume to 8 and 16 samples. A maximum number of four samples per drillhole were allowed. Cell discretisation was 3 (E) x 3 (N) x 4 (RL) and no octant-based searching was utilised. Model validation was carried out visually, graphically, and statistically to ensure that the block model grade reasonably represents the drillhole data. Cross sections, long sections and plan views were initially examined visually to ensure that the model grades honour the local composite drillhole grade trends. These visual checks confirm the model reflects the trends of grades in the drillholes. Statistical comparison of the mean drillhole grades with the block model grade shows reasonably similar mean grades. The IDS check estimate shows similar grades to the OK model, adding confidence that the grade estimate has performed well. The model grades and drill grades were then plotted on histograms and probability plots to compare the grade population distributions. This showed reasonably similar distributions with the expected smoothing effect from the estimation taken into account. Swath or trend plots were generated to compare drillhole and block model with SiO2% grades compared at 400 m E, 800 m N and 2 m RL intervals. The trend plots generally demonstrate reasonable spatial correlation between the model estimate and drillhole grades after consideration of drill coverage, volume variance effects and expected smoothing. No reconciliation data is available as no mining has taken place.
Moisture	Tonnages have been estimated on a dry, in situ, basis.

Criteria	Commentary
	The sampled sand material was generally reasonably dry, with data collected from the density testing of seven intervals showing an average moisture content of 2.9%.
Cut-off parameters	No cut-off parameters have been applied, as both sand types appear to be readily amenable to beneficiation to a suitable product specification through relatively simple metallurgical processes as demonstrated by reported metallurgical testing results.
Mining factors or assumptions	It has been assumed that these deposits will be amenable to open cut mining methods and are economic to exploit to the depths currently modelled. No assumptions regarding minimum mining widths and dilution have been made. No mining has yet taken place.
Metallurgical factors or assumptions	2018 testing: A composite auger sand sample from Arrowsmith North was tested in Ireland. The sample was screened at 4mm to remove oversize particles. The remaining material was then subjected to an attrition process followed by spiral and magnetic separation methods. Attrition testing was carried out a retention period of 5 minutes, with the sample washed after attritioning to remove any liberated fine particles. Spiral testing was then carried out with approximately 80kg of attritioned material, after which the samples then underwent wet magnetic separation to explore the possibility of reducing the magnetic mineral content. Chemical analysis showed a general decrease in the Al_2O_3. Processing, attritioning and washing the material removed the largest fraction of Al_2O_3. The spiral separation process produced samples where the largest fraction of Al_2O_3 was found in the heavy mineral fraction. Magnetic separation resulted in the largest fraction of Al_2O_3 being in the magnetic fraction. The results for Fe_2O_3 follow the same general trend as for Al_2O_3. The percentage fraction of SiO2 in the samples increased during the test process. Attritioning and washing the material removed fines and silt, which increased the SiO_2 content. The spirals test produced samples where the largest fraction of SiO_2 was found in the light fraction. Magnetic separation indicated that the largest fraction of SiO_2 was in the middling fraction. 2019 testing: raw material remaining from 2018 was removed from storage and was screened at 1 mm to remove oversize material and organics. The sand was then wet screened through a 0.212 mm sieve and PSD test run which showed that the +0.212 mm material contains some fines (3.25% passing the 0.212 mm sieve) and in contrast the -0.212 mm sample contains a large amount of fines with 27.2% passing the 0.053 mm sieve. Chemical analysis showed that the -0.212 mm fraction contains more Al_2O_3 and Fe_2O_3 than the +0.212 mm fraction, due to higher clay fraction in the finer sample. The 0.212-1 mm fraction was then attritioned for 5 minutes and washed over a 0.063 mm sieve, highlighting that the attrition and washing process removed fine particles, and reduced Al_2O_3, Fe_2O_3 and TiO_2 contents. The 0.212 mm material was then processed in a spirals test unit and three fractions were produced, namely heavy, middling and light. Particle size distribution analysis showed that the heavies contain the highest amount of fines and that the lights contain the lowest amount of fines, probably because fine-grained dense minerals containing Fe and Ti are concentrated with the heavy fraction. This observation was borne out by chemical analysis which showed that Al_2O_3, $Fe_2O_3$and TiO_2 are highest in the heavy fraction. These elements are lowest in the middling and light fractions, and lower than the feed material. Magnetic separation results in an increase in SiO_2 and a decrease in Al_2O_3, Fe_2O_3 and TiO_2 in the non-magnetic fraction compared with the feed material. The composite sample tested by CDE in 2018 and 2019 indicates that a product with AFS ~45 should be achievable and that some coarser AFS ~20 product may also be achievable.

Criteria	Commentary
	Most foundry sands fall into the range of ~0.1mm to 0.5mm and they are produced to meet specific size distributions which are commonly described by a number known as the 'AFS number'. The higher the AFS number, the finer the sand. Other foundry sand specifications include roundness and sphericity, clay content (generally <0.5%), moisture and SiO2 content, which should be achievable with suitably processed Arrowsmith North silica sand. CSA Global is of the opinion that process testwork on the composite drill sample indicates that the Arrowsmith North deposit should be suitable for the eventual production of silica sand for glass, ceramics and foundry markets. In addition, project location and logistics support the classification of the Arrowsmith North deposit as an Inferred industrial Mineral Resource in terms of Clause 49 of the JORC Code.
Environmental factors or assumptions	No assumptions regarding waste and process residue disposal options have been made. It is assumed that such disposal will not present a significant hurdle to exploitation of the deposit and that any disposal and potential environmental impacts would be correctly managed as required under the regulatory permitting conditions. VRX Silica has indicated that initial botanical studies are underway, and in the modelling the top 500 mm is reserved for rehabilitation purposes and is depleted from the model and is not reported.
Bulk density	Seven, certified, dry in situ bulk density measurements were completed by Construction Sciences Pty Ltd using a nuclear densometer. The results from the seven measurements are corrected based on the measured moisture factor. The mean dry in situ density result of 1.66 t/m3 is used for all modelled material reported in the MRE.
Classification	Classification of the MRE was carried out accounting for the level of geological understanding of the deposit, quality of samples, density data and drillhole spacing. The MRE has been classified in accordance with the JORC Code (2012 Edition) using a qualitative approach. All factors that have been considered have been adequately communicated in Section 1 and Section 3 of this Table. Overall the mineralisation trends are reasonably consistent over the drill sections. The MRE appropriately reflects the view of the Competent Person.
Audits or reviews	Internal audits were completed by CSA Global, which verified the technical inputs, methodology, parameters, and results of the estimate. No external audits have been undertaken.
Discussion of relative accuracy/ confidence	The relative accuracy of the MRE is reflected in the reporting of the Mineral Resource as per the guidelines of the JORC Code (2012). The Mineral Resource statement relates to global estimates of in situ tonnes and grade.