13 December 2018

ASX ANNOUNCEMENT

Arrowsmith Central Maiden Mineral Resource

Highlights:

- ***Inferred Mineral Resource of 28 million tonnes @ 97.7% SiO_2***
- ***Result is from shallow hand auger drilling***
- ***Aircore drilling expected to significantly increase the Mineral Resource***
- ***Metallurgical testwork to date confirms glass-making quality achievable***
- ***Takes total VRX Mineral Resources of silica sand to 412 Mt***

VRX Silica Limited (**VRX Silica** or **Company**) **(ASX:VRX)** is pleased to announce the results from the independent estimate of the Mineral Resource at its Arrowsmith Central prospect, which is contained within its Arrowsmith Silica Sand Project, located 270km north of Perth.

The result is based on an exploration program of 39 hand-held auger drill holes and is an acceptable standard for use in a Mineral Resource estimate publicly reported in accordance with the JORC Code.

The Resource area is a small portion of the tenement area, adequate for initial mining studies which can be increased substantially with future aircore drilling over an increased area.

Additional drilling is planned for early 2019 with the Company having recently completed an extensive Aboriginal Heritage survey with representatives of the Southern Yamatji claimant group for a more intensive and wider ranging drill program.

VRX Silica Managing Director Bruce Maluish said: *"Arrowsmith Central is immediately adjacent to the Eneabba – Geraldton rail line to export bulk products out of Geraldton which offers a unique low capex logistics solution."*

This resource adds to the two previously announced silica sand resources, Arrowsmith North, "*Arrowsmith North Maiden Mineral Resource*" 2 October 2018, and Muchea, "*Muchea Silica Sand Project Maiden Resource*" 20 November 2018.

ASX: VRX

Capital Structure

Shares on Issue:
365 million

Unlisted Options:
63 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.

Biranup base metals and gold Project adjacent to the Tropicana Gold Mine, WA, (subject to option with MCT*).*

Warrawanda Nickel Project south of Newman, 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

The exploration program also provided a bulk sample which was used for the second and third iteration of metallurgical testwork and has verified that the sand can be beneficiated to glass-making quality (VRX announcement 20 September 2018). An additional testwork program, which is underway, is investigating the recovery and quality of products for the foundry industry, particularly in Korea.

The Company recently announced potential offtake partners who can be supplied from the Arrowsmith Central Resource.

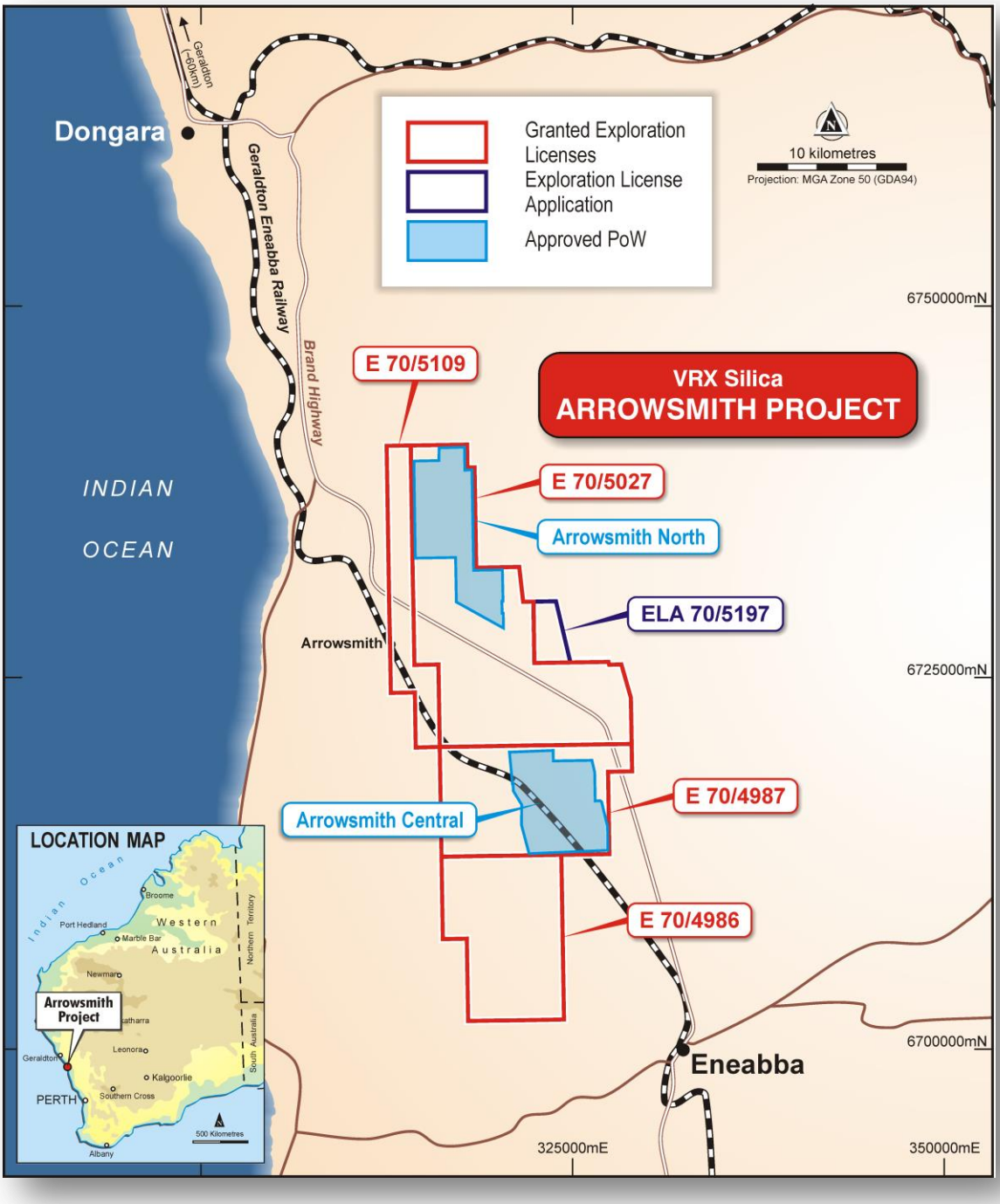


Figure 1: Arrowsmith Silica Sand Project Location

Executive Summary

VRX Silica engaged CSA Global to prepare a maiden Mineral Resource estimate (**MRE**) for the Arrowsmith Central target area reportable under the guidelines of the JORC Code. Arrowsmith Central is part of the Arrowsmith Project, 270km north of Perth. See Figure 1 above.

The MRE for the Arrowsmith Central Deposit comprises 28 Mt @ 97.7% SiO_2 reported in accordance with the JORC Code 2012[1] Edition. The MRE is based on the results obtained from 39 hand-auger drill holes for 98.6 m and defines the modelled silica sand layer. Based on metallurgical testwork completed to-date, the silica sand at Arrowsmith Central is 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 glass making.

The MRE results are shown in Table 1. Summary information is included in this announcement and a JORC 2012 Table 1 is included as Appendix 1.

Table 1: Arrowsmith Central Mineral Resource

Classification	Million Tonnes	SiO_2%	Al_2O_3%	Fe_2O_3%	K_2O%	LOI%	TiO_2%
Inferred	**28**	**97.7**	**1.2**	**0.3**	**0.3**	**0.5**	**0.2**

**Note: Interpreted silica sand layer is domained above a basal surface wireframe defined based on the current drill sampling depths. A depletion zone consisting of the upper 0.5 m is reserved for rehabilitation purposes, is not estimated or reported. Differences may occur due to rounding.*

Competent Persons Statements

The information in this Report that relates to Arrowsmith Exploration Results is based on data collected 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 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

[1] Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The JORC Code, 2012 Edition. Prepared by: The Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC).

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 Central 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. 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 a 3-d wireframe basal surface for the silica sands. This basal surface is nominally limited to the drill hole depths and the modelled extents are limited to within the VRX Silica nominated Arrowsmith Central target area. The surface is based on the geological boundaries defined by logged silica sand from the drill data 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. The Geraldton to Eneabba railway line and reserve passes through the target area and is depleted from the reported Mineral Resources. (ASX LR 5.8.1 Estimation methodology)
- Grade estimation was completed using inverse distance weighting to the power of two. (ASX LR 5.8.1 Estimation methodology)
- The Mineral Resource is quoted from all classified blocks above the defined basal surface wireframe for the silica sand layer and below the overburden surface layer. (ASX LR 5.8.1 cut-off grades
- The Mineral Resource was classified as 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 20% of the interpreted mineralisation is considered to be 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 Central may be classified as an industrial Mineral Resource in terms of Clause 49. (ASX LR 5.8.1 Mining, metallurgy & economic modifying factors)

Detailed Information

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 an alluvial plain with pale deep sands predominating in the target area of interest. Outside the target area are seasonally inundated swampy areas, poorly drained clayey sand plains, and low hills with relict dunes having variable sand thickness and limestone outcrops. See Figure 2 below:

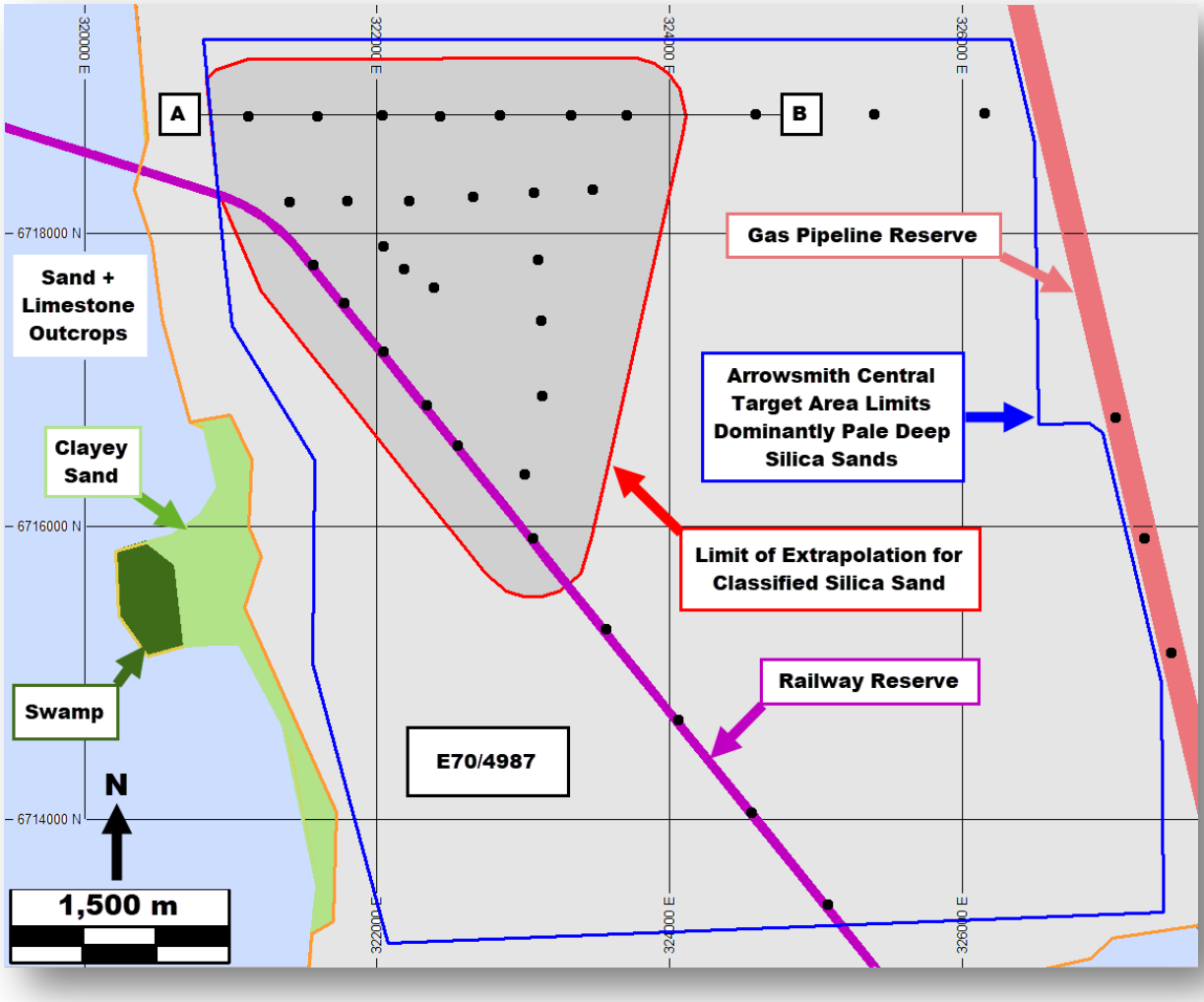


Figure 2: Simplified geology of the Arrowsmith Central Area. Figure 6 section line A – B shown. Tenements as in Figure 1

Source: Outlines based on DOAG soil mapping data, refined based on drill data.

Bulk Testwork

As was announced to ASX on 20 September 2018 – "*Silica Sand Bulk Testwork Results*" it has been demonstrated that the Arrowsmith Central sand can be upgraded using a simple flowchart to produce glass grade silica sand. A bulk 300kg metallurgical composite was generated from selected auger holes, used in this MRE. See Figure 3 below for holes selected for bulk testwork:

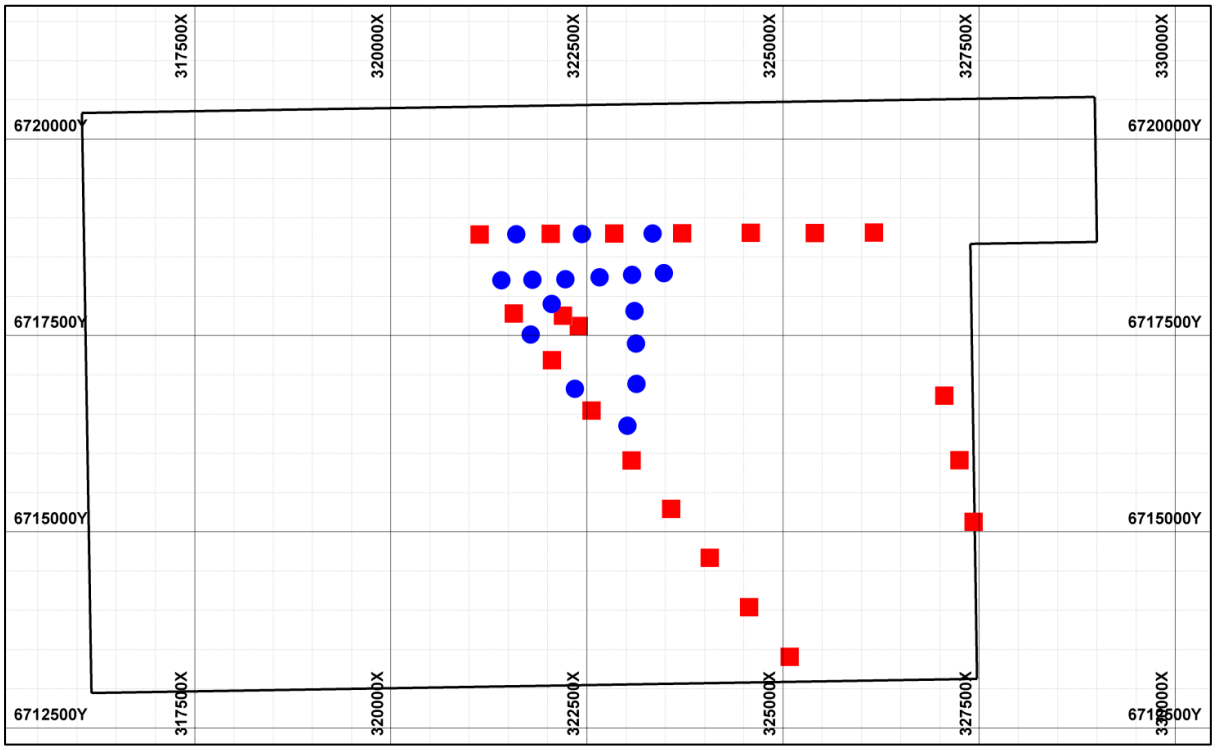


Figure 3: Arrowsmith Central Metallurgy holes, Red squares= CDE composite; Blue circles = Nagrom composite. Map grid 2.5 km x 2.5 km; north to top of map. Tenement E70/4987

The composite (Red Squares) was sent to the CDE Global facility in Cookstown, Ireland. The Bulk testwork returned the following results, Table 2 below, after de-sliming, attritioning, spirals and magnetic separation. The final product grade and particle sizes as reported are considered to be of glass making quality.

A composite (Blue Circles) has been sent to Nagrom in Perth for foundry sand testwork. Results will be available late December 2018.

Table 2: CDE Global Bulk Testwork results

SAMPLE MATERIAL	SAMPLE DESCRIPTION	Al_2O_3 ppm	Fe_2O_3 ppm	K_2O ppm	TiO_2 ppm	LOI_{1000C} %	SiO_2 Calc.	SiO_2 + LOI
ARROWSMITH CENTRAL	Raw Material	12,684	2,452	3,270	1,889	0.57	97.35	97.92
	Non-magnetic	**2,566**	**341**	**785**	**267**	**0.13**	**99.5**	**99.6**

Mineral Resource Estimate

Drilling

Drilling over the project area has been completed by means of hand auger (see Figure 4) with hole depths ranging from 0.9 m to 3.8 m and an average depth of 2.5 m. Drilling was completed along existing tracks, the railway reserve and gas pipeline reserve, with an initial nominal drill spacing of 800 m between holes. Infill drilling was completed in the north western area that then forms a nominal 400 m by 400 m drilling pattern (see Figure 2).

Figure 4: Hand auguring sand at Arrowsmith

Mineral Resource Modelling

The Mineral Resource is estimated above 3-d wireframe basal surfaces for the silica sand layer (see Figure 6). The basal surface is nominally limited to the auger drill hole depths, it should be noted that the full depth of silica sand was not tested due to the sampling methodology. The modelled extents are limited to within the VRX Silica nominated Arrowsmith Central target area based on the geologically logged drill data and with reference to the publicly available soil mapping data (see Figure 2). Based on the soil mapping data the entire Arrowsmith Central target area is underlain by a single mixed silica sand material unit, which consists of dominant pale deep sands with interspersed yellow sands. The overburden, reserved for rehabilitation, forms the upper boundary of the estimated Mineral Resource and is depleted from the reported Mineral Resource. The railway reserve which is 40 m wide is also depleted from the Mineral Resource (see Figure 2).

All available samples in the Arrowsmith Central area have been flagged for further statistical analysis and use in the grade estimation. The drilling in Arrowsmith Central is relatively shallow and the area that is considered to have sufficient drilling data to imply geological and grade continuity, and can therefore be classified as Mineral Resources under the guidelines of the JORC Code, is limited to the area that is drilled at a nominal 400 m drill spacing in the north west of the target area (see Figure 2). The classified and hence reported Mineral Resources have a nominal maximum extrapolation of grade estimated material beyond drill data points of roughly 400 m (see Figure 2), and are additionally constrained within the VRX Silica nominated target area.

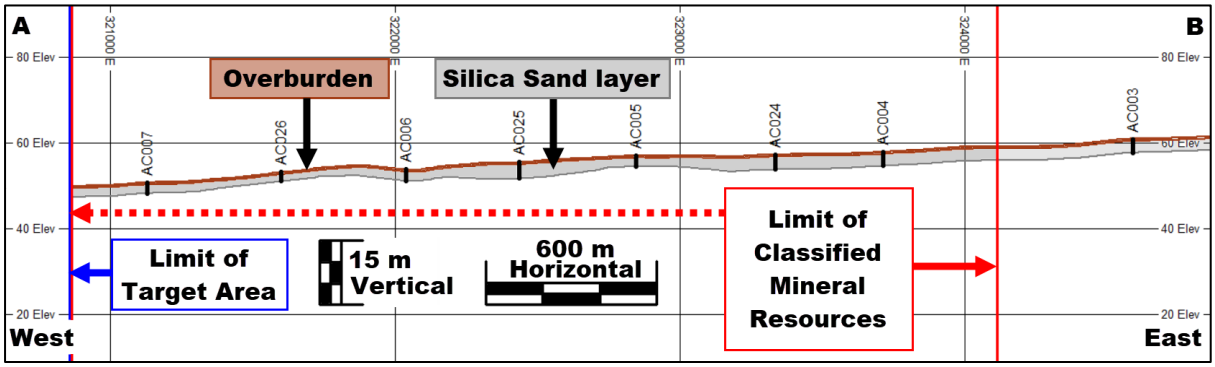


Figure 6: Cross section A – B at 6738150 mN (See** Error! Reference source not found.**), Looking north; 15 times vertical exaggeration

Mineral Resource Classification

The Mineral Resource is classified as Inferred according to the principles contained in the JORC Code. Material that has been classified as Inferred was considered by the Competent Person to be sufficiently informed by geological and sampling data to imply but not verify geological and grade continuity between data points. The results of the MRE are presented in Table 3.

Table 3 Arrowsmith Central Mineral Resource

Classification	Million Tonnes	SiO_2%	Al_2O_3%	Fe_2O_3%	K_2O%	LOI%	TiO_2%
Inferred	**28**	**97.7**	**1.2**	**0.3**	**0.3**	**0.5**	**0.2**

**Note: Interpreted silica sand layer is domained above a basal surface wireframe defined based on the current drill sampling depths. A depletion zone consisting of the upper 0.5 m is reserved for rehabilitation purposes, is not estimated or reported. Differences may occur due to rounding.*

Future Work

A further iteration of testwork has been commenced by CDE Global using a refined flow sheet to incorporate additional attritioning to further improve the quality of the potential final products.

The results of this work are expected to be available later in December 2018. Process circuit design and engineering will then follow, allowing for capital cost estimates to be generated in the first quarter of 2019.

The Company has an approved program of works and has completed a required heritage survey to infill and extend the Arrowsmith Central Inferred Mineral Resource with the intention of upgrading areas of the resource to an Indicated category. This drilling will be done by an Aircore drill rig which will not have the depth limitations of the hand auger technique and the full depth of sand will be drill tested.

The drill program is expected to commence early in 2019.

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

About VRX Silica

VRX Silica Ltd (**VRX Silica**) (**ASX: VRX**) has significant silica sand projects with four granted exploration licences and one application pending over the Arrowsmith Silica Sand Project, located 270km north of Perth, Western Australia, and one granted exploration licence and one application pending over the Muchea Silica Sand Project, 50km north of Perth, which complements Arrowsmith with additional significant silica sand resources. Initial testwork has confirmed that the silica sand at both Projects can be upgraded to glassmaking quality. Further work is underway on both projects to enable feasibility studies to be completed.

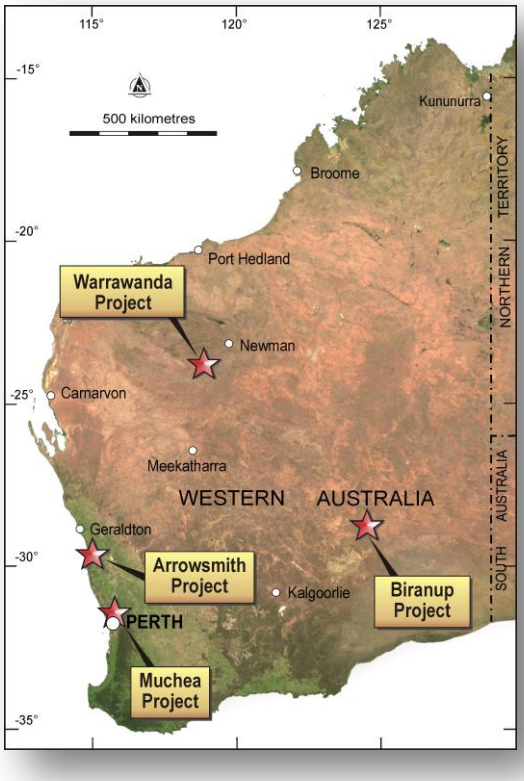
VRX Silica also has granted tenements at its Biranup Project, adjacent to the Tropicana Gold Mine in Western Australia's Goldfields that are prospective for gold and base metals, which are currently under option for partial sale and farm-in joint venture.

Also, in Western Australia, 40km south of Newman, is VRX Silica's Warrawanda Nickel Project, which is prospective for nickel sulphides.

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



ASX Announcements

VRX Silica (2017). New Arrowsmith Silica Sand Project. ASX Release 12 October 2017.

VRX Silica (2017). Arrowsmith Silica Sands Project Sampling. ASX Release 14 December 2017.

VRX Silica (2018). Arrowsmith Silica Sands Project Testwork. ASX Release 30 January 2018.

VRX Silica (2018). Arrowsmith Silica Sand Project Tenement Grants. ASX Release 12 April 2018.

VRX Silica (2018). Arrowsmith Silica Sand Project Update. ASX Release 15 August 2018.

VRX Silica (2018). Arrowsmith Silica Sand Project. ASX Release 30 August 2018.

VRX Silica (2018). Silica Sand Bulk Testwork Results. ASX Release 20 September 2018.

VRX Silica (2018). Arrowsmith North Maiden Mineral Resource. ASX Release 2 October 2018.

VRX Silica (2018). Muchea Silica Sand Project Maiden Resource. ASX Release 20 November 2018.

VRX Silica (2018). Three LOIs for Silica Sand Offtake. ASX Release 11 December 2018.

APPENDIX 1 – JORC 2012 Table 1

Sections 1 and 2 provided by VRX Silica Ltd., Section 3 provided by CSA Global

Section 1: Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	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	A 100mm diameter hand screw auger was used to drill until hole collapse.
Drill sample recovery	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.
Subsampling techniques and sample preparation	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 -75µm.

Criteria	Commentary
Quality of analytical 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 analyses	Significant intersections validated against geological logging. No twinned holes have been completed.
Location of data points	Drill hole locations were measured by hand-held GPS with the expected relative accuracy; GDA94 MGA Zone 50 grid coordinate system is used. The reduced level (RL) of the drilling collars is generated from publicly available SRTM data. The SRTM data is compared to the available Landgate Geodetic Survey Marks to validate the data that it is appropriate for use.
Data spacing and distribution	Auger holes were completed along existing tracks, the railway reserve and gas pipeline reserve, with an initial nominal drill spacing of 800 m between holes. Infill drilling was completed in the north western area that then forms a nominal 400 m by 400 m drilling pattern Due to the relatively low variability of assays between drill holes the current spacing is sufficient for the estimation of a Mineral Resource. No sample compositing (down hole) has been done.
Orientation of data in relation to geological structure	Sampling is being done on aeolian sand dunes the auger orientation is therefore considered appropriate.
Sample security	All samples are selected onsite under the supervision of VRX Silica Geological staff. 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 yet.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	Auger drilling was done on Tenement E70/4987 which are 100% held by a wholly owned subsidiary of VRX Silica Limited. The tenement was granted on 06/04/2018, and all drilling was conducted on vacant Crown land.
Exploration done by other parties	Minor exploration for mineral sands has been completed by various Companies. No exploration for silica sand has been done.
Geology	The targeted silica sand deposits are the aeolian sand dunes that overlie the Pleistocene limestones and paleo-coastline which host the Eneabba heavy mineral deposits.
Drillhole 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. Seven, certified, dry *in situ* bulk density measurements were completed by Construction Sciences Pty Ltd using a nuclear densometer. No groundwater was intersected during drilling. The mineralisation is unconsolidated sand.
Further work	A first pass Metallurgical testwork program has been completed with demonstrates conventional sand processing techniques can upgrade the sand to a high value product. Further testwork is required to determine the best quality final product. Infill drilling will be undertaken to further assess the depth and variability of the high-grade silica sand.

Section 3: Estimation and Reporting of Mineral Resources

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	No site visit by representatives of CSA Global has taken place at this early stage of project development. CSA Global has previous experience with this project in the form of an Independent Technical Assessment Report completed for Ventnor. Based on this work and publicly available data relating to the area CSA Global has no reason to believe that the interpreted mineralisation does not exist. It is envisaged that a site visit would be required by a Competent Person, or their representative when further drilling is undertaken that may result in a higher classification than Inferred under the guidelines of the JORC Code.
Geological interpretation	Silica sand mineralisation at Arrowsmith Central occurs within the coastal regions of the Perth Basin, and the targeted silica sand deposits are the aeolian sands 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 deep sands predominating (logged by Ventnor as white sands) and lesser yellow sands, with some clayey sand, swampy areas and occasional ironstone ridges. The geological modelling was completed based on this soil mapping data in conjunction with the auger drill logging data. The Mineral Resource is estimated above a 3-d wireframe basal surface for the silica sand. This basal surface is nominally limited to the auger drill hole depths, and it should be noted that the full depth of silica sand was not tested due to the sampling methodology. The modelled extents of the silica sands are further limited to within the Ventnor nominated Arrowsmith Central target area. The surface humus layer is typically about 300 mm thick. In consultation with Ventnor, CSA Global decided 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. The railway reserve with a width of 40 m is also depleted from the Mineral Resources. Both the white and yellow sands are readily amenable to beneficiation as demonstrated by the composite sample testing completed to date, and the complete silica sand unit is therefore modelled as a single unit. At this stage of resource development with the current drill spacing it is also not practical to attempt a separation of pale from yellow sand types. The reported Mineral Resources are further constrained to within the north western part of the project which has a nominal 400 m by 400 m

Criteria	Commentary
	drilling pattern. 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 400 m past known drill data points has been applied with the material additionally constrained within the Ventnor nominated target area and by the reporting area limit. Although it is understood that the thickness of the sand layers is likely to be much more than current auger drilling depths over significant areas of the modelled area, the vertical extents have been nominally limited to the current auger drilling depths. Approximately 20% 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 modelled silca sand material within the target area are roughly 3.6 km north to south, and on average roughly 2.5 km west to east. The modelled silica sand is roughly horizontal, with low relief. The currently modelled thickness of the sands is on average about 2.5 m, ranging up to the maximum depth of auger drilling of 3.8 m.
Estimation and modelling techniques	Inverse distance squared (IDS) was the selected interpolation method, with Ordinary Kriging (OK) used as a check estimate. Grade estimation was carried out at the parent cell scale, with sub-blocks assigned parent block grades for the full extent of modelled silica sand layer. 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 no significant outlier grades in the interpreted sand types that required top-cutting. In addition to SiO_2, the grade variables Al_2O_3, Fe_2O_3, K_2O, LOI, and TiO_2 are estimated into the model. A volume block model was constructed in Datamine constrained by the topography, overburden layer, silica sand layer, material depletion zone and target area limiting wireframes. Analysis of the drill spacing shows that the nominal average drill spacing is 400 m by 400 m for the reported area of the modelled silica sand

Criteria	Commentary
	layer. Spatial (variogram) analysis was completed on SiO2 from the 1 m drill composite samples. The resultant modelled variograms were not considered robust enough to allow an OK estimation based on their parameters to be used as the primary grade estimation technique. The parameters have been used for an OK check estimate on the selected primary IDS estimate Based on the sample spacing a parent block size of 200 m(E) x 200 m(N) x 2 m(RL) or nominally half the average drill spacing, was selected for the model. Sub-cells down to 12.5 m(E) x 12.5 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 were 750 m (X) x 750 m (Y) x 10 m (RL). A minimum of 9 and a maximum of 15 samples, were used to estimate each parent block. The maximum numbers were reduced for the second search volume to 12 samples and in the third search volume the maximum and minimum were reduced to 6 and 9 samples respectively. 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 OK check estimate shows similar grades to the IDS 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 SiO_2% grades compared at 200 m E, 400 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. The sampled sand material was generally reasonably dry, with data collected from the density testing of seven intervals showing an average moisture content of 3.3%.

Criteria	Commentary
Cut-off parameters	No cut-off parameters have been applied, as the modelled silica sand appears to be readily amenable to beneficiation to a suitable product specification through relatively simple metallurgical processes as demonstrated by initial 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	A composite auger sand sample from Arrowsmith Central was tested in Ireland during 2018. 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 SiO_2 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. CSA Global is of the opinion that available process testwork indicates that product quality is considered favourable for eventual economic extraction and production of silica sand for glass markets and potentially also for other markets such as foundry sand. In addition, project location and logistics support the classification of the Arrowsmith Central deposit as an Inferred industrial Mineral Resource in terms of Clause 49 of the JORC Code.

Criteria	Commentary
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. Ventnor 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	Four, certified, dry in situ bulk density measurements were completed by Construction Sciences Pty Ltd using a nuclear densometer. The results from the four measurements are corrected based on the measured moisture factor. The mean dry in situ density result of 1.63 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.