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Metallurgical testwork delivers premium low iron high-grade Silica

- An **84 ppm Fe_2O_3** average grade across all test results achieving the <100 ppm premium specification used for photovoltaic applications
- SiO_2 beneficiated to **99.8%** (highest)
- Excellent average recovery yields of greater than 96% SiO_2 across all test results
- Organic flotation reagents used to achieve these results in this recent work (environmentally friendly)

Allup Silica Limited (ASX: **APS**) ("**Allup**" or "**Company**") is pleased to announce the results of its latest metallurgical tests based on improvements in the Company's process circuit design. Results, which are detailed below, have produced a consistent high-grade <100 ppm Fe_2O_3 silica sands product from samples taken at the Company's Sparkler Silica Exploration Project in Western Australia.

Grades of this purity are considered suitable for the photo-voltaic (solar panel) industry (*ASX Announcement 16 May 2022)* which is a prime target market for Allup Silica.

The average of the testwork across all four samples is shown in Table 1 that follows:

Table 1: Average Metallurgical Results across all Sighter Tests

SiO_2 %	Fe_2O_3 ppm	Al_2O_3 ppm	TiO_2 ppm
99.7	84	283	263

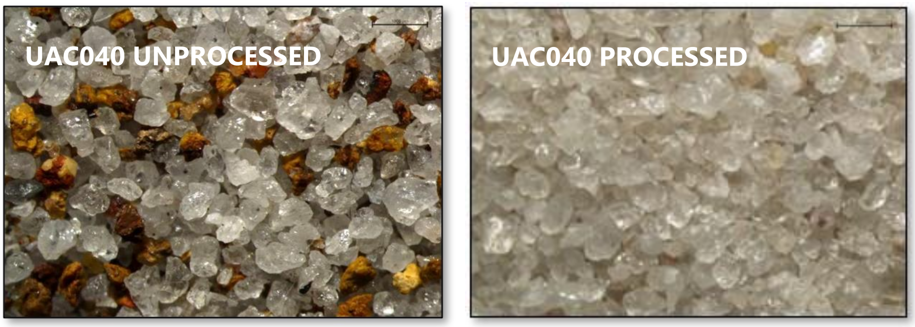


Figure 1: Micrographs of Sample UAC040

Why is Achieving this Grade Important?

Silica sand is a raw material used in the production of optical fibre, ceramics, refractory materials and glassmaking, including the specialty glass required for photovoltaic (solar panels) and other high-tech product applications like tablet and mobile telephone glass.

The presence of impurities, particularly Fe_2O_3, has adverse effects on the silica sand product as it impairs transmission in optical fibres, reduces transparency of glass, discolours ceramic products and lowers the melting point of refractory materials[1]. Silica sand, with these impurities, is also typically less valuable.

REFERENCE:
[1] *Chammas, E. & Panias, Dimitrios & Taxiarchou, Maria & Anastasakis, G.N. & Paspaliaris, Ioannis. (2001). Removal of iron and other major impurities from silica sand for the production of high added value materials.*

The typical specifications for each application are tabulated below:

Table 2: SiO_2 end-use applications by specification

Uses	SiO_2	Fe_2O_3
Optical Fibres	> 99.9 %	< 1 ppm
Optical Glass	> 99.9 %	< 10 ppm
Glass - Photovoltaic	> 99.5 %	< 100 ppm
Premium Ceramics	> 97.5 %	< 100 ppm
Ceramic	> 97.5 %	< 2000 ppm
Glass - Flat	> 99 %	< 400 ppm
Glass - Container	> 98.5 %	< 1800 ppm
Foundry	98.6-99.6%	< 300 ppm

Results from the recently improved process circuit design include:

- Fe_2O_3 impurity lowered to an **average of 84 ppm Fe_2O_3** (65 ppm to 110 ppm across four samples)
- SiO_2 grades between **99.7%** (lowest) and **99.8%** (highest)
- An excellent 95%-97% recovery (yield) of SiO_2 was achieved across all of the sighter tests, and this will be the focus of further optimisation work

Allup Silica Chairperson, Andrew Haythorpe said:

"The results from the improvements we are making to the process circuit are very encouraging and indicate that we do have the right projects and the high purity silica sands to start with. Being able to achieve the high purity specs required for the manufacture of PV cells means we are on track, and we look forward to being able to supply samples to potential customers as we progress to development on our Sparkler Project."

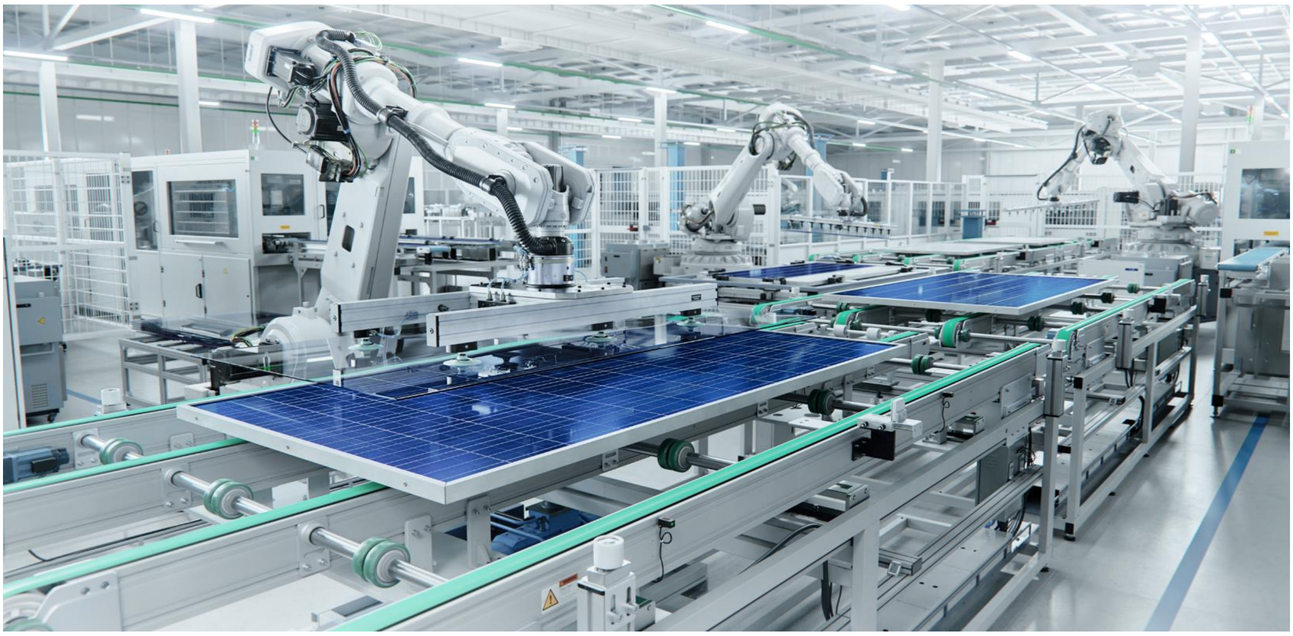


Figure 2: Photovoltaic manufacturing facility - Image is not the Company property and is showing the machinery used in the manufacturing of solar panels and is representing the end product in which silica sand is a raw material. Image is not the metallurgical testing being undertaken.

Results from the Company's work on its process circuit design is a positive step towards understanding how to produce a high purity silica sand that is suitable for use by the photovoltaic industry (specification >99.5% SiO_2 and <100 ppm Fe_2O_3).

Testwork is ongoing to further refine the proposed process circuit methodology and achieve the ultimate goal of a consistent iron at sub-100 ppm across all of Allup Silica's Exploration Projects.

The next work program will serve multiple objectives:

- Producing a more consistent low impurity (<100 ppm Fe_2O_3) product
- Looking for potential to reduce capex and operating costs (reduction of upstream classifying)
- Enabling consistent Quality Assurance/Quality Control (QA/QC) production
- Achieving a methodology that could potentially support an increase in the depth of sand to be viably mined, as this may potentially increase estimated mineral reserves

Summary of Report

The testwork was carried out on a total of four samples from the Sparkler A Silica Exploration Project, from samples taken as part of the current Inferred Mineral Resource Estimate (ASX Announcement 30 June 2022). The metallurgical testwork was conducted at the Nagrom Mineral Processing facility in Perth, and the results issued to Battery Limits Metallurgical Consultants for review and preparation of an Independent Metallurgical Report.

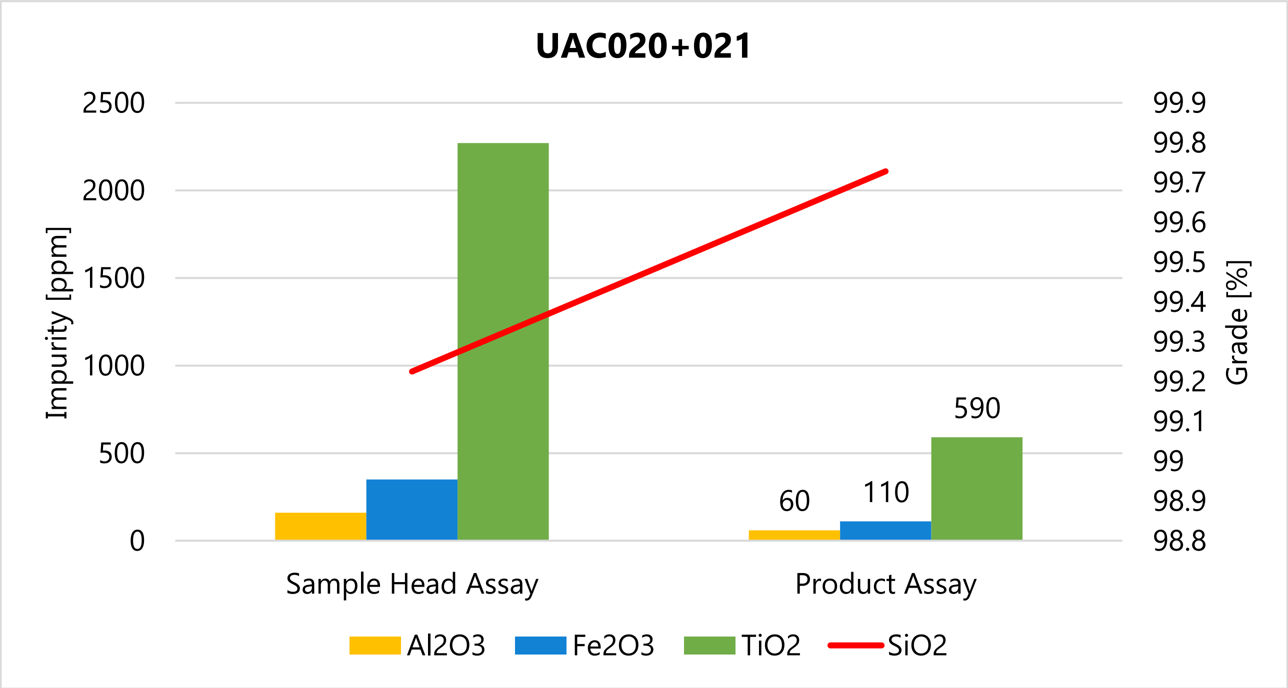
Table 3: Metallurgical Sample Head Assay Data

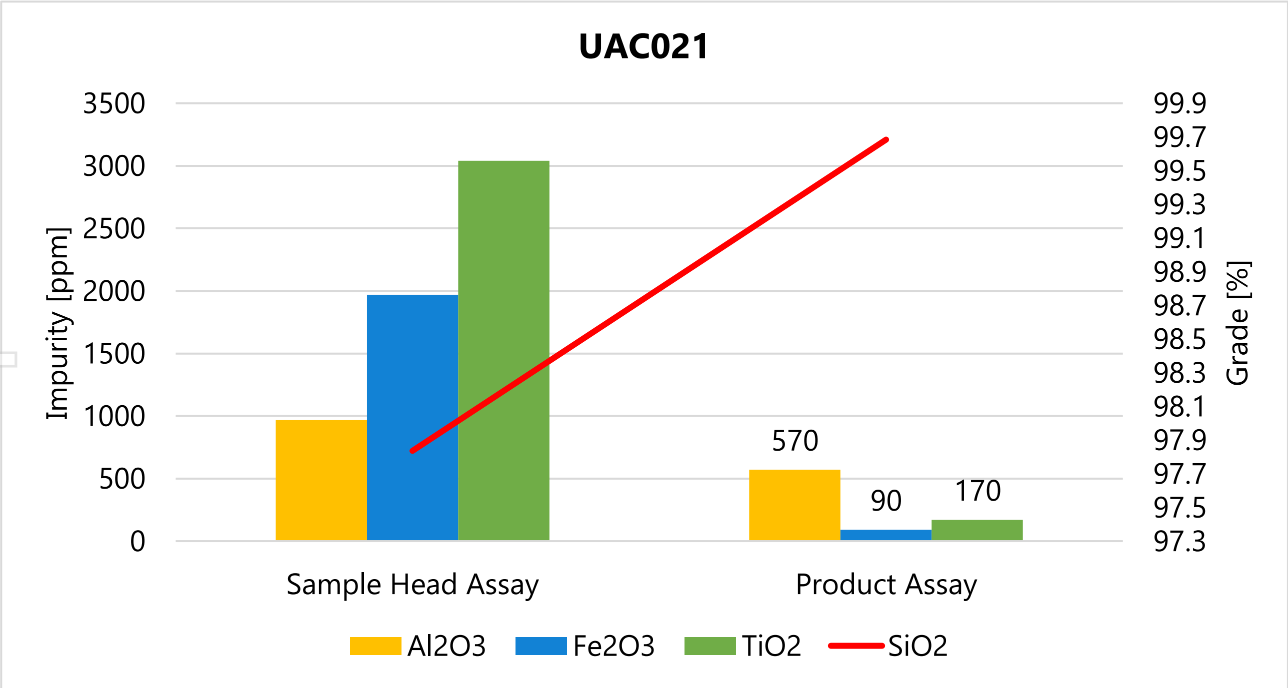
SAMPLE	SiO_2	Al_2O_3	CaO	Cr_2O_3	Fe_2O_3	K_2O	MgO	MnO	Na_2O	TiO_2	V_2O_5	LOI_{1000}
	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	TGA
	%	%	%	%	%	%	%	%	%	%	%	%
UAC020+ 021	99.225	0.016	0.006	<0.001	0.035	0.003	0.004	0.002	<0.001	0.227	<0.001	0.24
UAC021	97.836	0.966	0.0014	0.001	0.197	0.039	0.011	0.007	0.014	0.304	0.003	0.51
UAC033	98.577	0.478	0.009	<0.001	0.196	0.015	0.008	0.008	0.008	0.269	0.002	0.25
UAC040	97.541	1.194	0.009	<0.001	0.217	0.028	0.009	0.007	0.015	0.357	0.002	0.59

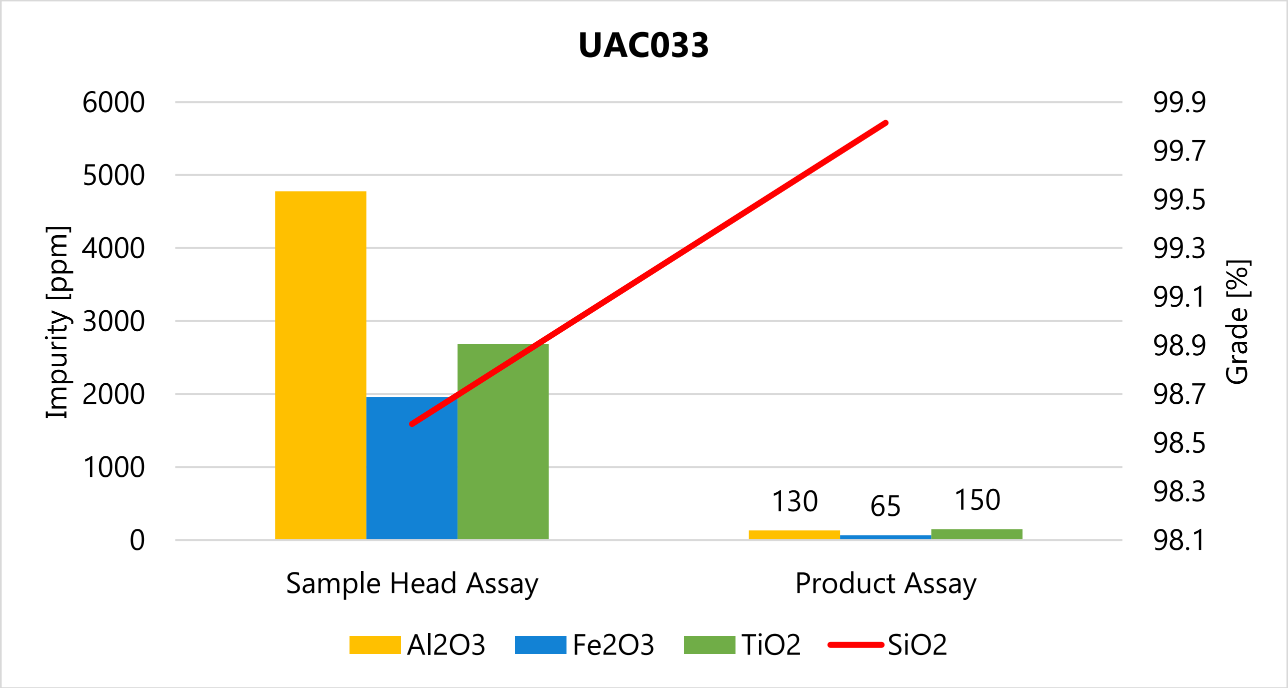
The objective of the testwork program was to beneficiate a high purity silica sand with low impurities, specifically Fe_2O_3<100 ppm (0.01%).

The testwork program comprised of a standard silica sand process circuit, including flotation. The summary data is primarily focussed on the sighter flotation results.

The results indicate good recovery (>95%) of SiO_2 to float tails (product), and a reduction in the grade of impurities in all cases, with a reduction in Fe_2O_3 of between 11 and 33 % (Fe_2O_3) recovered to concentrate.


UAC020+021
Impurity [ppm]
2500
2000
1500
1000
500
0
Grade [%]
99.9
99.8
99.7
99.6
99.5
99.4
99.3
99.2
99.1
99
98.9
98.8
60
110
590
Sample Head Assay
Product Assay
Al2O3
Fe2O3
TiO2
SiO2


UAC021
Impurity [ppm]
3500
3000
2500
2000
1500
1000
500
0
Grade [%]
99.9
99.7
99.5
99.3
99.1
98.9
98.7
98.5
98.3
98.1
97.9
97.7
97.5
97.3
570
90
170
Sample Head Assay
Product Assay
Al2O3
Fe2O3
TiO2
SiO2



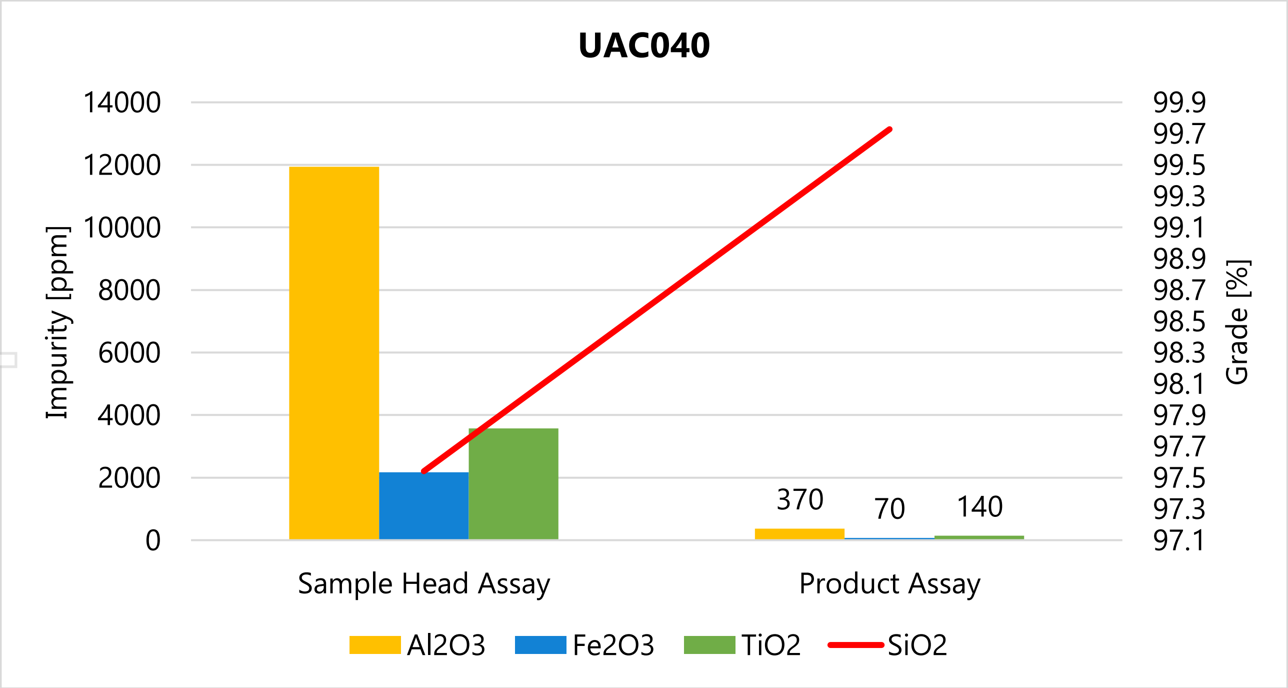


Diagram 1: Testwork Results Represented in Graphical Form

Overall, from the four sighter tests conducted, grades of SiO_2 varied, with 3 achieving Fe_2O_3 grade with <100 ppm and significant reduction in the Al_2O_3 and TiO_2.

Table 4: Rougher Flotation Tailing (Product) Assay Data

SAMPLE	SiO_2	Al_2O_3	CaO	Cr_2O_3	Fe_2O_3	K_2O	MgO	MnO	Na_2O	TiO_2	V_2O_5	LOI_{1000}
	XRF	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	TGA
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
UAC020+021	99.728	60	40	<5	110	<50	5	<5	<50	590	<5	0.13
UAC021	99.684	570	80	<5	90	50	15	<5	50	170	<5	0.13
UAC033	99.815	130	80	<5	65	<50	10	<5	<50	150	<5	0.09
UAC040	99.693	370	80	<5	70	100	15	<5	150	140	<5	0.16

The Company believes that high-grade silica sand of this specification with a low iron content will be in high demand for use in the manufacture of premium ultra-clear cover glass production, particularly for the burgeoning photovoltaic (solar panel) manufacturing industry.

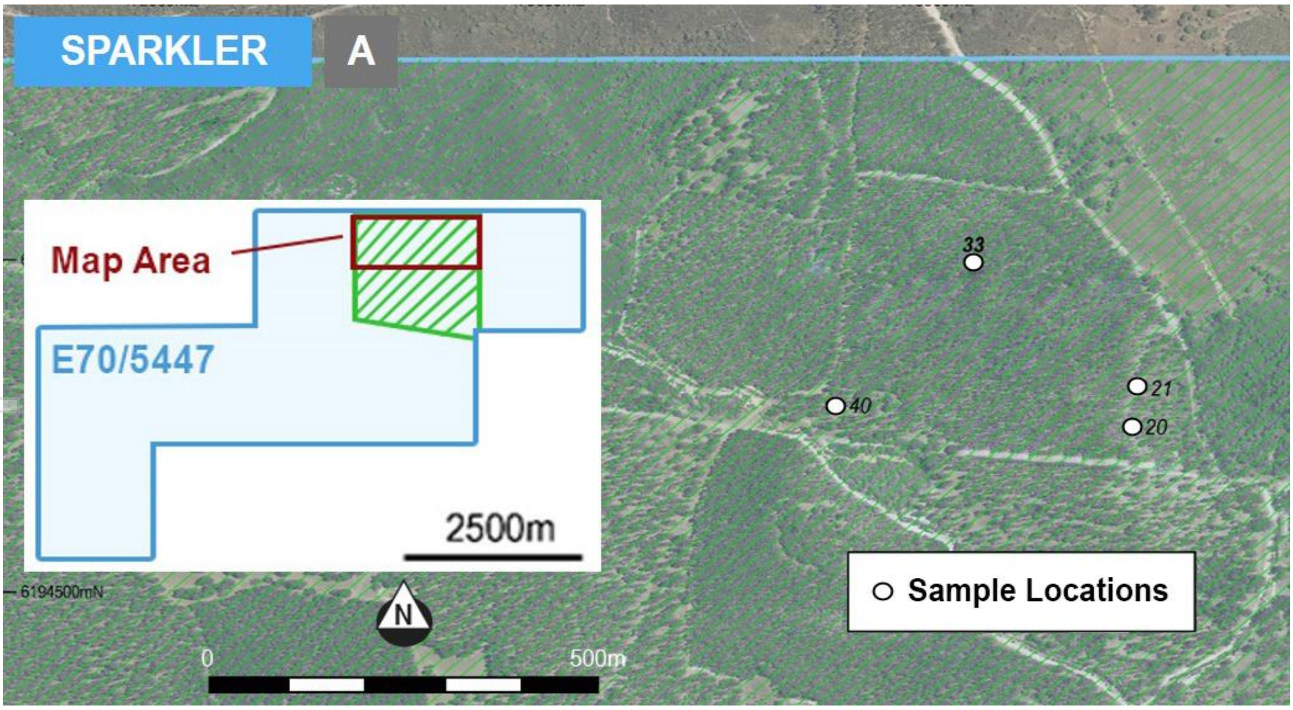


Figure 3: Sparkler Silica Sands Project tenement area showing high grade test sample locations

Competent Person Statement

The information in this announcement that relates to Exploration Results is based on information compiled by Nicholas Revell, who is a Member of The Australian Institute of Geoscience and who has more than five years' experience in the field of activity being reported on. Mr Revell is the Technical Director of the Company.

Mr Revell has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Revell consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

This Announcement has been approved for release by the Board of Directors.

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ABOUT ALLUP SILICA LIMITED

Allup Silica is a public silica exploration company focused on the future development of our silica sand tenements located in several Western Australian exploration project locations and one location in the Northern Territory. West Australian sites are in the South-West; in the North-East near Wyndham, and two others are in the Southern Goldfields near Esperance. The Company's plan is to work towards development of a commercial silica sand product that meets the industry specifications of the sector we are aiming for. Silica is a critical commodity, particularly in the production of photovoltaic (solar) panels and other critical industrial applications.

Section 1 Sampling Techniques and Data

Criteria	JORC Code Explanation	Commentary
Sampling techniques	*Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* *Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	Allup Silica air-core drilling at Sparkler A (EL70/5447) was sampled on different intervals from 1m to 2m intervals.
Drilling Techniques	*Drill type (eg core, reverse circulation, open- hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	Allup Silica conducted air-core drilling at the Sparkler A (EL70/5447). Drill DR22 Moorooka track drill , compressor size 500/200 , 3 1/2inch air core bit.
Drill Sample Recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.* *Measures taken to maximise sample recovery and ensure representative nature of the samples.* *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	Allup Silica air-core recoveries were good due to the shallow nature of the holes. The drilling program will produce material for metallurgical test-work to provide processing routes for the production of high quality silica sand product.
Logging	*Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* *The total length and percentage of the relevant intersections logged.*	All drill holes have been geologically logged for major lithological contacts.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.* *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* *Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.*	Allup Sand took an approximate 1-2kg sub sample from air-core drill spoil pile. Duplicate samples were taken at varying intervals. It will also provide material used in trial beneficiation processing analysis/testing to further identify the specification of the silica product after it has been processed.

	Whether sample sizes are appropriate to the grain size of the material being sampled.	
Quality of assay data and laboratory tests	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	All samples were submitted to and assayed at the Nagrom Mineral Processing Facility in Perth, Australia. Assay methods were Xray Fluorescence analysis for 23 elements and ICP-MS. The laboratory included a suite of duplicates, blanks, and standards in the assaying process with no significant issues revealed. Accuracy of results regarding XRF analysis due to sample size on the final product was raised. ICP analysis was used to resolve issues with accuracy of representation. No handheld XRF instruments or spectrometers were used during the program.
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.* *The use of twinned holes.* *The verification of significant intersections by either independent or alternative company personnel.* *Discuss any adjustment to assay data.*	There has been no verification of the sampling and assaying. There has been no adjustment to the assay data.
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* *Specification of the grid system used.* *Quality and adequacy of topographic control.*	BHP Holes were originally reported in AMG Zone 50 co-ordinates. They have been converted to Map Grid Australia (MGA) Zone 50. Method of surveying the BHP hole collars is not known. Allup Silica drilling and sampling was surveyed with a hand-held GPS with +/- 5m accuracy.
Data spacing and distribution	*Data spacing for reporting of Exploration Results.* *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* *Whether sample compositing has been applied.*	Nominal hole spacing was generally random over the project area and followed established tracks
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	The BHP drilling was vertical through generally flat lying sediments including the silica sand. Allup Silica drilling was vertical through flay lying sand deposits at Sparkler A (EL70/5447).
Sample security	*The measures taken to ensure sample security.*	Original core samples were collected in sample bags with the sample number tagged. Sample bags are collected in large rice bags for dispatch. The rice bags are labelled with the sample numbers and company name and are

		transported directly the Nagrom Mineral Processing facility in Perth, Western Australia by personnel from Allup Silica. The inventory of samples is confirmed by Nagrom and compared with the sample submission logs provided by Allup Silica.

Section 2 Reporting of Exploration Results

Criteria	JORC Code Explanation	Commentary
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	The Sparkler A (EL70/5447) tenements have been granted to Allup Silica Limited tenement number E70/5447. The tenements are in, good standing with no known encumbrances that might impede future activities. The presence of freehold title may require granted permissions to be obtained before certain exploration activities are conducted ie clearing for drilling. Landowner agreement and consent has been received in writing.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	BHP Mineral has carried out drilling programs targeting the basement and in doing so has drilled through sand horizons. Allup Silica has used this drilling to target further sand deposits on Sparkler A (EL70/5447).
Geology	*Deposit type, geological setting and style of mineralisation.*	The areas of interest are located on elevated sand plain and residual laterite terrain of the Biranup Zone in the Proterozoic Albany-Fraser Orogen of south-west Western Australia. It is underlain by quartzo-feldspathic gneisses, mainly derived from granitoid rocks of the Biranup and Nornalup Complexes. The high grade, pure quartz silica sands are part of the mid to late Eocene Werillup Formation which consists of alluvial river sands and gravel, laid on low grade coal and lignite laid down in coastal swamps. The host stratigraphy at Unicup is up to 30m in thickness and crop out at surface. The Eocene coastal plain and continental margin sedimentary rocks (like the Eucla Basin stratigraphy) lie directly on a truncated profile of saprolitic Albany-Fraser rocks of Proterozoic age which in the Unicup area consist of the Biranup Complex: meta-sedimentary quart-feldspar schist, garnet-amphibole schist, graphitic schist; and gneissic rocks (mainly felsic orthogneiss) cut by late mafic dykes, and late-stage pegmatites. Granitic to granodioritic late

		stage intrusives occur especially in the southern parts of the Biranup Complex.

Drill hole information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* *- easting and northing of the drill hole collar,* *- elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar,* *- dip and azimuth of the hole,* *- down hole length and interception depth hole length.* *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	Drilling and sampling details are contained and tabulated within the report. The BHP drilling was used to indicate the presence and thickness of sand deposits. The BHP sampling and assaying has not been utilised in this report as it is not relevant to silica sand. Drilling by Allup on the Sparkler A (EL70/5447) is tabulated in the report.
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* *Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	Not applicable as no drilling was undertaken. Exploration results are reported as individual sample intervals. No high-grade cuts have been applied to the reporting of exploration results. Metal equivalent values have not been used.
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.* *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	Not applicable as no drilling was undertaken.
Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	Relevant diagrams have been included within the document.
Balanced reporting	*Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	All relevant exploration results have been reported.
Other substantive exploration data	*Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	Bulk samples from the Sparkler A Silica Exploration Project from four separate drill holes were submitted for preliminary metallurgical testwork to assess the potential to generate a high-quality silica sand product from the quartz sands intersected taken.

Further work	*The nature and scale of planned further work (eg tests for lateral extensions or large scale step out drilling. Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Future metallurgical testwork programs will optimise the process as defined by these initial results. New samples from subsequent drilling programs will be incorporated into this process circuit.