Perpetual RESOURCES LIMITED

ASX RELEASE

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ASX: PEC

CORPORATE DIRECTORY

Executive Chairman
Julian Babarczy

Managing Director
Robert Benussi

Non-Executive Director
Brett Grosvenor

Non-Executive Director & Company Secretary
George Karafotias

Projects

Beharra Silica Sands Project
Sargon Hub
Eneabba Hub

CONTACT DETAILS:
Suite 801
Level 8
84 Pitt Street
Sydney NSW 2000

George Karafotias
Phone | +61 042 086 550

Robert Benussi
Phone | +61 410 415 335

Upgraded Mineral Resource Estimate for Beharra Results in a 25% Increase in Tonnage to 139Mt at 98.6% SiO_2

Highlights

- ***Beharra Mineral Resource Estimate tonnage increases by approximately 25%, from 111Mt to 139Mt at 98.6% SiO_2.***
- ***Resource category upgraded from Inferred to Indicated, paving the way for a Mineral Reserve Estimate to be concluded once the Pre-feasibility Study (PFS) is finalised.***
- ***Beharra PFS entering document finalisation stage, with announcement due in the coming week.***

Perpetual Resources Limited (**ASX: PEC**, "PEC" or "the Company") is pleased to announce the finalisation of an upgraded Mineral Resource Estimate (MRE) for the Company's flagship Beharra high grade silica sand project.

The upgraded Mineral Resource Estimate was prepared by Snowden Mining Consultants Pty Ltd (Snowden). The Maiden MRE, also prepared by Snowden, was previously released to the market on 22nd July 2020. The new MRE resulted in an additional 28Mt for a total Indicated Mineral Resource of 139Mt at a SiO_2 grade at 98.6% which was the same grade as that reported in the Maiden MRE. Perpetual has previously demonstrated that the silica grade can be increased to >99.5% SiO_2 with application of straight forward industry standard processing methods, delivering a lower impurity profile for sale into the fast-growing Asia Pacific (APAC) silica sand markets.

Perpetual's Managing Director, Mr Robert Benussi provided the following commentary, "It is pleasing to have reported an increase in Mineral Resource tonnage at Beharra, which has further increased the potential to meet high grade silica sand demand for a considerable period. Notably, this increase did not come at the expense of grade, with consistent SiO_2 results showing no material increase in deleterious oxides.

This Resource upgrade is a further marker of the quality of the Beharra Project, which we expect will be further demonstrated with the imminent release of the Beharra PFS. We continue to believe Beharra is a truly compelling asset and look forward to demonstrating this with our upcoming study".

The Upgraded MRE was based on previous drilling which underpinned the maiden MRE in July 2020. It also included an additional air core drilling program which was completed in September 2020 (please see ASX Announcement dated 7th December 2020). Refer to Figures 1 and 2.

Sand	Volume (Mm^3)	Density	Tonnes (Mt)	SiO_2	Al_2O_3	TiO_2	Fe_2O_3	LOI
Yellow	8.1	1.64	13.2	98.2	0.50	0.23	0.23	0.51
White	76.7	1.64	125.8	98.6	0.41	0.38	0.23	0.21
Total	**84.8**	**1.64**	**139.0**	**98.6**	**0.42**	**0.35**	**0.23**	**0.24**

Figure 1: Upgraded Beharra Indicated Mineral Resource Estimate

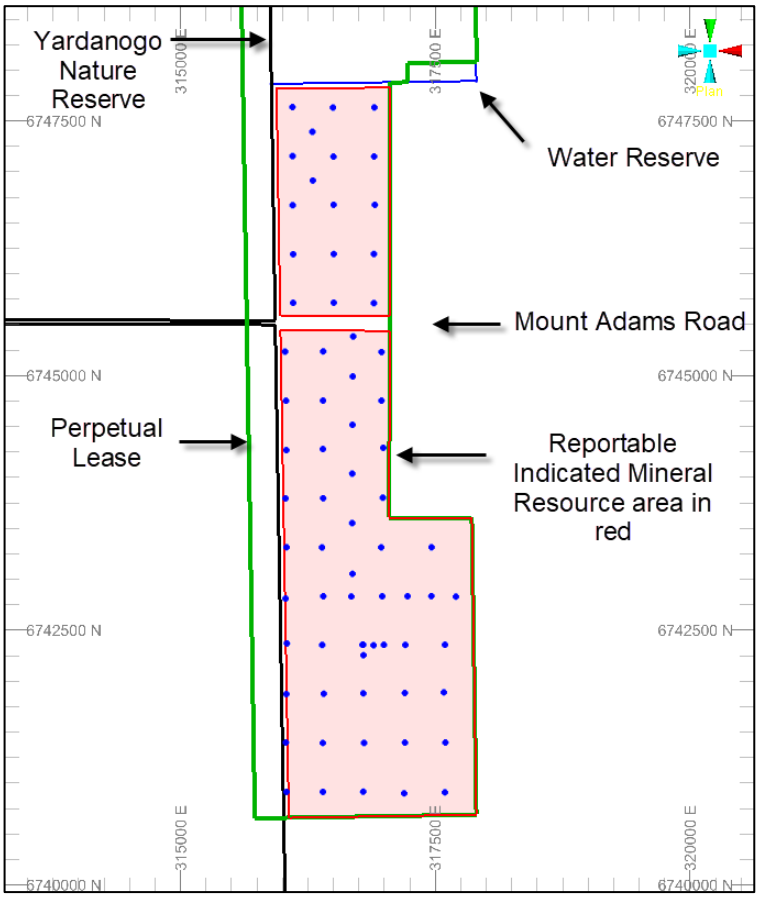

Figure 2: Plan view of Upgraded Mineral Resource Estimate Reporting Area

Upgraded Mineral Resource Estimate Overview

The Beharra deposit was initially explored in February 2019 using auger drilling across the southern extent of tenement E 70/5221. A total of 38 holes to a maximum depth of 2 m were completed on a ~800 mE x ~400 mN grid, covering 7,215 m of strike and an average width of 1,700 m.

Positive results from the auger drilling led to an Aircore program completed in March 2020 over the same southern portion of the tenement. A total of 40 holes for 506.7 m was completed on a ~400 mE x ~480 mN grid.

After the maiden Inferred Mineral Resource estimate was announced in July 2020 a further 32 Aircore holes were completed in September 2020 on the northern Exploration Target, with some additional infill and twin holes in the southern portion. Refer to Figure 3.

The March 2020 and September 2020 drill samples were used to generate the current MRE. The auger holes were not included in the estimate. In addition to ICP determined assays, an additional 155 samples were used to determine particle size distribution across the resource area. Refer to Figure 4.

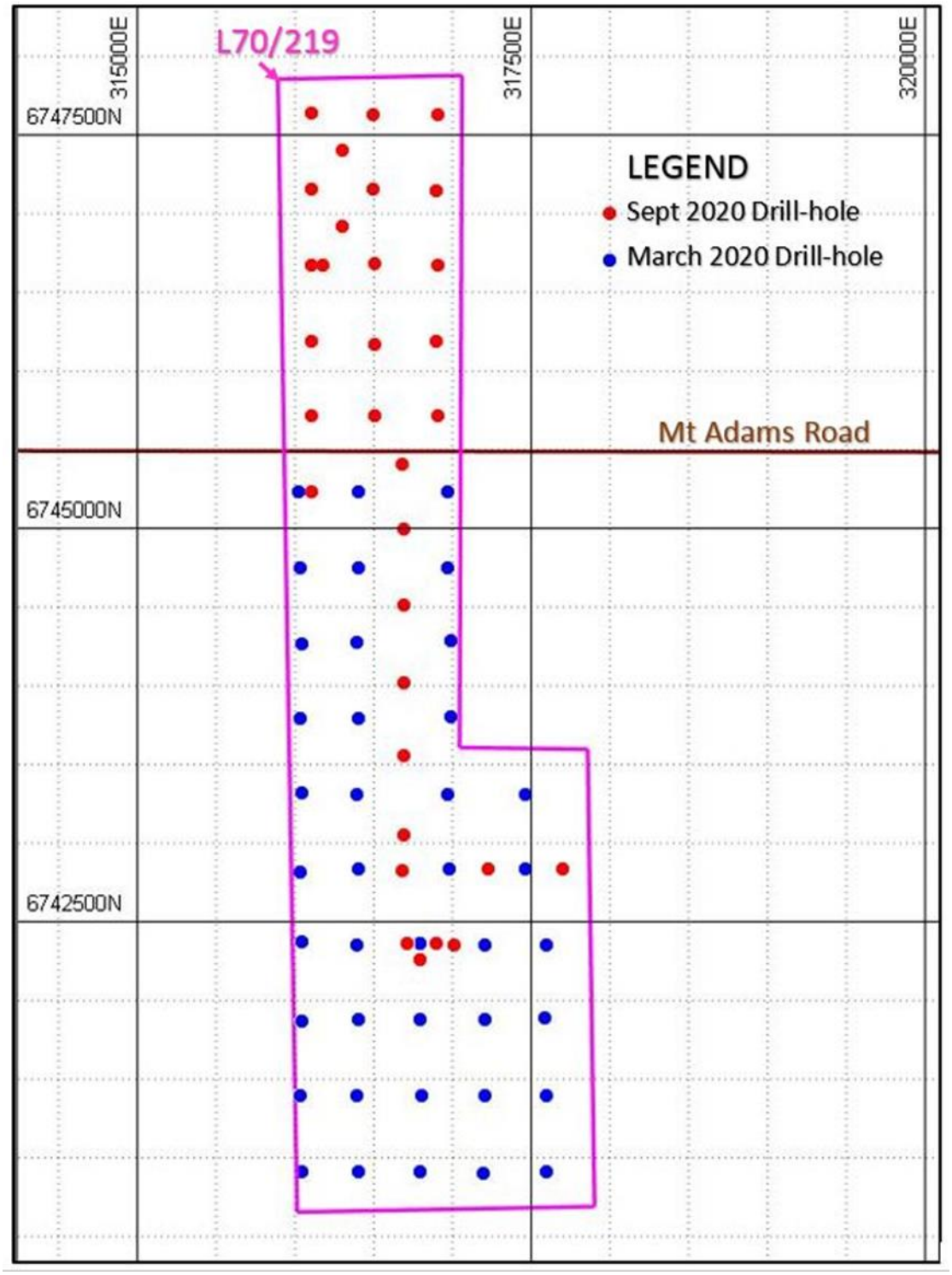

Figure 3: Aircore drill hole location plan

Drilling Method	Assay Method	Number of Holes	Number of Samples	Sampled length (m)
Aircore	ICP	72	879	859.7
Aircore	PSD	18	155	156.0

Figure 4: Drilling data used for Beharra Estimate September 2020

The Aircore samples were logged, including estimates of grain size, sorting and texture, and colour. Particular attention has been taken to ensure a more scientific and less subjective approach to colour because colour (white to grey shades, and pale yellow shades) is one of the targeting features. Refer to Figure 5.

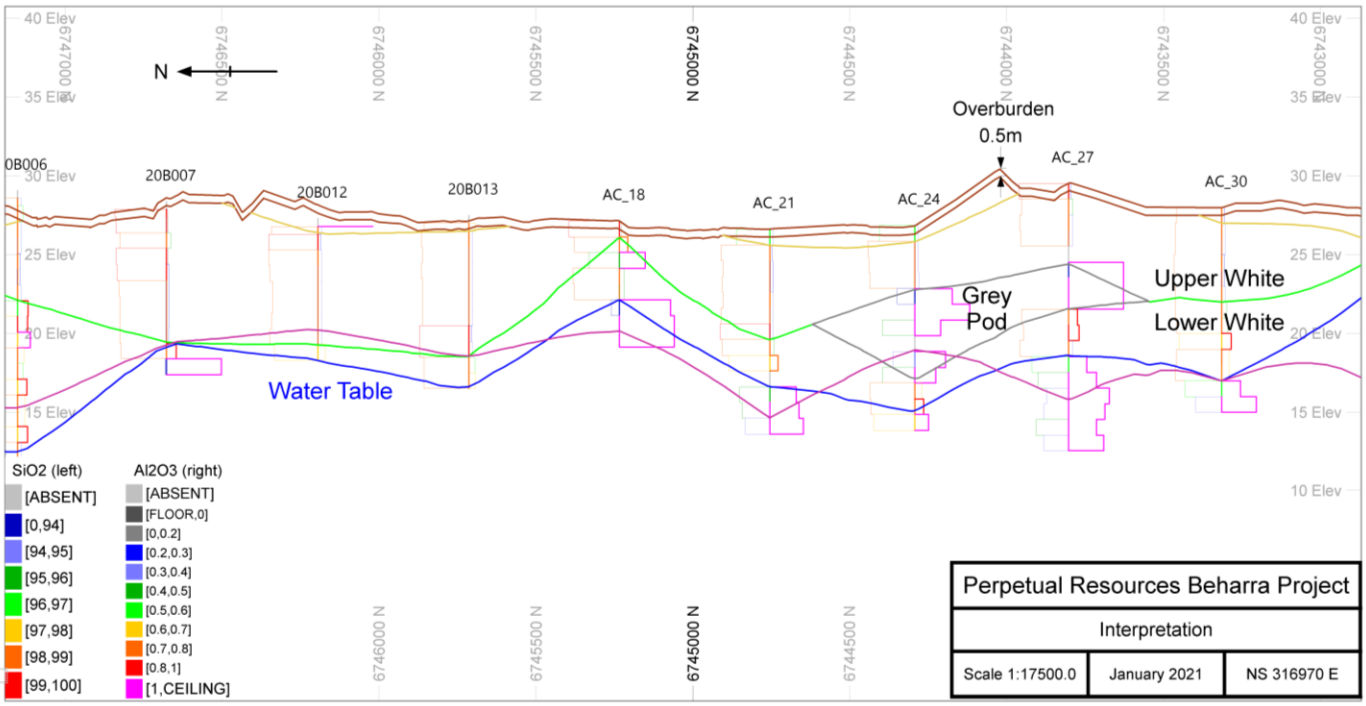

Figure 5: Beharra Project north-south section showing interpretation

Chip tray samples for each hole were photographed. The chip tray for drill hole AC-25 and AC-27 are shown in Figures 6 and 7 below.

Figure 6: Chip tray for drill hole AC-25

Figure 7: Chip tray for drill hole AC-27

The industry standard analytical technique used to determine the SiO_2 grade is to calculate by difference. Samples are digested in a specialised four-acid mixture and then analysed by means of ICP-optical (atomic) emission spectrometry analysis which reads the quantities of element other than silica. Loss on ignition (LOI) at 1,000°C is determined by thermal gravimetric analyser (TGA). These quantities are then deducted from 100% to determine the SiO_2 grade.

Further check logging was undertaken, and representative subsamples were collected for duplicate analysis. Subsampling was carried out by spearing the samples selected and collecting approximately 1 kg of sample. The duplicates have been utilised at the rate of 1:18. The 1 kg subsamples, including duplicates and blanks, were submitted to Intertek Genalysis analytical laboratory located in Maddington in Western Perth for drying, splitting to 100 g for pulverisation to a P_{90}-75 µm (90% smaller than 75 microns) particle size in a zircon bowl. The sample preparation methods are considered industry standard for silica sands.

Update on Beharra PFS

The Beharra PFS has progressed into the final stages of documentation with an announcement anticipated in the coming week.

About Perpetual Resources Limited:

Perpetual Resources Limited (Perpetual) is a focussed explorer of silica sands, aiming to produce high purity silica and construction sands for domestic and international markets.

Perpetual's flagship asset, the Beharra Project is located 300km north of Perth and is 96km south of the port town of Geraldton in Western Australia. Access to the Project from Geraldton (to the north) and Perth (to the South) is via the sealed Brand Highway, thence by the Mt Adams unsealed road providing access to the centre of the tenure.

Mt Adams Road which Intersects the Beharra Tenement

Brand Highway Proximal to Beharra

The port of Geraldton is utilised as a bulk material handling facility and is currently employed for the export of s, grains, copper concentrates, zinc concentrates, nickel concentrates, mineral sands, talc and iron ore. . Extensive heavy mineral sands mining occurs to the south of the Project area, lime sands mining to the west and natural gas production to the south of the Project.

The Beharra Project comprises of a single exploration licence, E70/5221, covering an effective land area of 56.8km^2. Auger and air core drilling has confirmed the presence of extensive, high purity silica sands, with a maiden Mineral Resource Estimate completed in July 2020 and an Inferred Mineral Resource Estimate completed in March 2021. A detailed Pre-Feasibility Study for Beharra is now underway with delivery expected in March 2021.

Silica Sands Market

Silica sands have an extensive range of uses including lower purity and grade applications such as construction sand, proppant sand used in well fracturing, and foundry sand. With increasing purity (>99.5% SiO_2) uses includes glass making including clear glass. Uses for purity >99.8% includes semi-conductor fillers, LCD screens, and optical glass.

This announcement has been approved for release by the Board of Perpetual.

Mineral Resource Estimation Summary

Geology and Geological Interpretation

Silica sand mineralisation at Beharra occurs within the coastal regions of the Perth Basin, and the targeted silica sand deposits are the aeolian quartz sand dunes that overlie the Pleistocene limestones and paleo-coastline. The geological modelling was completed based on the Aircore drill logging data and chemical analysis. For estimation purposes, six domains were established which have unique geochemical properties as well as an interpretation of the top of the water table.

Drilling, Sampling and Sub-sampling Techniques and Sample Analysis

Industry standard sampling was used to collect mostly 1 m samples from Aircore drill rigs. Certified laboratories were used to sub-sample and analyse the samples using four-acid digestion followed by Silica Sands 17-element ICP/OE analysis plus LOI at 1,000°C with SiO2 reported by difference.

Grade Estimation and Classification

Grade estimation was completed using ordinary kriging with hard boundaries applied between identified layers. Top cuts were applied to the data where required. The Mineral Resource was classified as Indicated based on data quality, sample spacing, grade continuity, geological continuity of the domains and metallurgical/process test results. Mineralogical, chemical and process testwork to date indicates that products for glass, ceramics and foundry sand markets are considered possible for eventual economic extraction from Beharra. In addition, potentially favourable logistics and project location support the classification of the Beharra deposit as an Indicated Mineral Resource in terms of JORC Code Clause 49.

Cut-offs

No cut-off grade has been used for the reported Mineral Resource as the layers considered potentially economic are amenable to beneficiation to a suitable product specification through relatively simple processes, as demonstrated by metallurgical testing results.

Mining and Metallurgy

Quartz (also known as silica) is produced commercially from a wide variety of deposits including unconsolidated sand, sandstone, quartzite, granite, aplite, and pegmatite. Silica sand and quartz are economical sources of SiO2 used in glass and ceramics manufacture, for which key deleterious elements include iron and titanium. Silica sand is also used for foundry mould manufacture.

Likely product specifications for the Beharra deposit are supported by the results of the composite auger sample process testwork program undertaken at Nagrom in Perth, and on the 2-tonne Aircore bulk sample by IHC Robbins in Brisbane.

-ENDS-

For enquiries regarding this release please contact:
Mr George Karafotias
Company Secretary
Ph +61 421 086 550

COMPETENT PERSONS STATEMENTS

The information in this report that relates to the March 2020 Exploration information for the Beharra Project is based on information compiled and fairly represented by Mr Colin Ross Hastings, who is a Member of the Australian Institute of Mining and Metallurgy and consultant to Perpetual Resources Limited. Mr Hastings is also a shareholder of Perpetual Resources Limited. Mr Hastings has sufficient experience relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he has undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Hastings consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

The information in this report that relates to the Exploration information for the Beharra Project from September 2020 onwards is based on information compiled and fairly represented by Mr John Doepel, who is a Member of the Australian Institute of Mining and Metallurgy and consultant to Perpetual Resources Limited. Mr Doepel has sufficient experience relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he has undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Doepel consents to the inclusion in this report of the matters based on this information 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 Elizabeth Haren, a Competent Person who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. Elizabeth Haren is employed as an associate Principal Geologist by Snowden Mining Consultants Pty Ltd, who was engaged by Perpetual Resources Limited. Elizabeth Haren has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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". Elizabeth Haren consents to the inclusion in the report of the matters based on her information 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 Dr Andrew Scogings, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy, a Member of the Australian Institute of Geoscientists and is a Registered Professional Geologist in Industrial Minerals. Andrew Scogings is employed as an associate Executive Consultant Geologist by Snowden Mining Consultants Pty Ltd. Dr Scogings has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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". Dr Scogings consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The metallurgical factors and assumptions for the bulk Aircore sample that relate to Mineral Resources have been reviewed and accepted by Mr Arno Kruger. Mr Kruger is a member of the Australasian Institute of Mining and Metallurgy and a full-time employee of IHC Robbins Pty Ltd. Mr Kruger has sufficient experience relevant to the style of mineralisation and type of deposit, and to the activity he undertook 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 Kruger consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

JORC Table 1 – Section 1: Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole 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 (e.g. '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 (e.g. submarine nodules) may warrant disclosure of detailed information.*	• Aircore drilling and sampling referred to in this report occurred in two separate programs: March 2020 and September 2020. • March 2020: Aircore samples were collected via a cyclone, the entire sample for each 1 m drill interval was collected and placed in a calico sample bag. No splitting on the rig was undertaken. The sample was labelled with the drill hole number and sample interval, and a waterproof tag nominating a sample number was placed in the bag and then sealed with a tie. • September 2020: Aircore samples were collected via a cyclone, the entire sample for each 1 m drill interval was collected and placed in a calico sample bag, labelled with the drill hole number and sample interval, and weighed.by a spring balance. A 1kg split was taken by spear and placed in a smaller calico bag, labelled with a sample number. • Aircore samples were collected from each metre drilled or part metre if the hole was not ended on a full metre. For the September program separate samples were taken for 0-0.5m and for 0.5m to 1m. Only the latter had a 1kg split taken from it. • Representative samples of each interval drilled were placed in a chip tray for reference. • Auger drilling and sampling referred to in this report and reported previously were obtained from hand auguring to a maximum depth of 2 m. • Three auger samples were collected from each hole being surface to 0.5 m, 0.5–1.0 m, and 1.0–2.0 m. The top metre of the hole was split into 2 samples to allow a separate sample of the top 0.5 m that contains organic matter associated with native ground cover. If sand mining operations were to be carried out, this top 0.5 m would be stockpiled for future rehabilitation, so at this time treating it separately is appropriate. • The shallow auger program was carried out to obtain representative sand samples to a maximum depth of 2 m for the reasons as described in the Company release of 12 February 2019.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. 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).*	• March 2020: A total of 32 Aircore drillholes were completed to an average depth of 12.3m, with the deepest hole ending at 17m. • September 2020 Aircore drilling was undertaken using a track mounted KL170 hydraulic top drive rig coupled to a 250psi compressor. An 84 mm vacuum bit was fitted to a 76mm outside diameter twin tube rod string. The internal diameter was 51mm. All holes were drilled vertically. • March 2020: A total of 40 Aircore drill holes were completed for an average depth of 12.7 m, with the deepest hole ending at 20 m.

Criteria	JORC Code explanation	Commentary
		• March 2020 Aircore drilling was undertaken using a track mounted Hitachi hydraulic top drive rig coupled to a 130 cfm/100 psi compressor. A 76 mm Aircore bit was fitted to 70 mm twin tube rod string. All holes were drilled vertically. • Auger drilling consisted of a manually hand operated 75 mm diameter sand auger (Dormer Sand Auger) with PVC casing utilised to reduce contamination potential as the auger is withdrawn from the hole. The auger was driven about 300 mm then retracted and the sample was placed in a UV resistant plastic bag and this continued until the sample interval was completed. The sample was labelled with the drill hole number and sample interval, then placed in a second plastic bag and sealed and removed from site for logging and sample preparation.
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.*	• March 2020: Aircore: each sample bag was weighed to determine the actual sample recovery, which resulted in an average sample weight of approximately 7.5 kg/m of sample. • September 2020: Aircore: each sample bag was weighed to determine the actual sample recovery, which resulted in an average sample weight of approximately 4 kg/m of sample. • March 2020: Aircore sampling was typically terminated on reaching the water table, which occurred around 10–12 m below surface level. • September 2020: Aircore sampling was typically terminated two metres below the water table. Hole depths ranged from 9 to 17 m. • The cyclones were cleaned regularly to ensure maximum and representative recovery. • For auger sampling, each sample bag was weighed to determine the actual sample recovery, which resulted in an average sample weight of 7.5 kg/m of sample. • The type of sand auger used provided a clean sample with less possibility of contamination compared to a flight auger.
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.*	• The samples have been sufficiently logged including estimates of grain size, sorting and texture, and colour. Particular attention has been taken to ensure a more scientific and less subjective approach to colour has been adopted because colour (white to grey shades, and pale yellow shades) is one of the targeting features. • Chip tray samples for each hole were photographed.
Subsampling 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.*	• Aircore samples were transported to Welshpool in Perth and locked in a secure storage shed.

Criteria	JORC Code explanation	Commentary
	• *Quality control procedures adopted for all subsampling 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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• March 2020: Further check logging was undertaken, and representative subsamples were taken for duplicate analysis. Subsampling was carried out by spearing the samples selected and collecting approximately 400 g of sample. The duplicates have been utilised at the rate of 1:20. • September 2020: Duplicate 1 kg sub-samples were taken in a ratio of 1:18 at site. • Blanks were generated from a publicly available washed sand product and taken by spearing a 20-bulk sample: March 2020 aprox.400 g samples; September 2020 approx. 1 kg samples. The blanks have been utilised at the rate of 1:20 in March and 1:18 in September. • March 2020: The prepared subsamples (duplicates and blanks) plus all the bulk drill samples were submitted to Nagrom Metallurgical Analytical Laboratories located in Kelmscott in Western Perth for drying, further splitting, and pulverisation in a zircon bowl. A subsample of 100 g with a P90 -75 µm particle size was utilised for analysis. • September 2020: The 1 kg subsamples, including duplicates and blanks, were submitted to Intertek Genalysis analytical laboratory located in Maddington in Western Perth for drying, splitting to 100 g for pulverisation to a P90 -75 µm particle size in a zircon bowl. • Auger samples were submitted to Intertek Laboratory in Maddington for drying, splitting, pulverisation in a zircon bowl. A subsample of 200 g with a 75 µm particle size is utilised for analysis. • Allowance was made for duplication by drilling a twin auger hole located within 1 m of each other. Three twin holes were drilled representing 8% duplicate sample. • The sample preparation methods are considered industry standard for silica sands. Records were kept describing whether the samples were submitted wet or dry. • The laboratory sample size taken is appropriate for the sand being targeted.
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 (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• March 2020: All the Aircore samples prepared by Nagrom were analysed at the same facility. The assay method for multi-element analysis consisted of prepared samples fused in a lithium borate flux with lithium nitrate additive then analysed by x-ray fluorescence (XRF) (test method XRF001). Loss on ignition (LOI) was also carried out on each sample out at 1,000°C (test method TGA002).

Criteria	JORC Code explanation	Commentary
		• Auger samples were submitted to the Intertek Laboratory in Maddington, Perth, Western Australia. The assay method for multi-element analysis consisted of four-acid digest including hydrofluoric, nitric, perchloric and hydrochloric acids in Teflon beakers with inductively coupled plasma (ICP)-optical (atomic) emission spectrometry finish. Silica is reported by difference. • March 2020: Inter-laboratory checking was carried out by submitting 28 prepared representative pulps (umpire samples) to the Intertek Laboratory located in Maddington. The samples were analysed by two methods, XRF (test method FB1/XRF20) and ICP-optical (atomic) emission spectrometry (test method 4ABSi/OE901). Samples for ICP analysis consisted of a four-acid digest including hydrofluoric, nitric, perchloric and hydrochloric acids in Teflon beakers. Silica is reported by difference. • March 2020: The same 28 samples analysed by Intertek were also analysed by ICP at Nagrom's laboratory. For analysis of Al_2O_3 and SiO_2 the samples were fused with sodium peroxide and digested in dilute hydrochloric acid and then analysed by ICP (test method ICP005). All other elements were determined by ICP after dissolution in an acid mixture (test method ICP003). • March 2020: Final analyses of the Aircore samples were carried out at Intertek's laboratory using four-acid digest followed by ICP determination. The samples used consisted of pulps that were prepared by Nagrom. • September 2020: Intertek's analysis method for Silica Sands analysis consisted of four-acid digestion followed by Silica Sands 17-element ICP/OE analysis plus Loss on ignition at 1,000°C with SiO_2 reported by difference. • September 2020: Inter-laboratory umpire analysis was carried out by submitting 20 pulps, and 20 non-pulverised portions of the same samples, from Intertek Genalysis to the Bureau Veritas laboratory located in Canning Vale, Perth. The samples were analysed by mixed acid digest (MA100) followed by 17 elements by ICP-OES (MA101) and LOI (TG001). Silica was reported by difference. • The extensive analysis by different laboratories and different methods are industry standard procedures and methods producing high level of confidence on the results produced. The ICP method is considered industry standard for reporting sand grades. • No geophysical tools were utilised for the process.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	• March 2020: There were no twin Aircore holes. • Twin holes were completed for three out of the 38 auger holes.

Criteria	JORC Code explanation	Commentary
	• *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• September 2020: One of the September Aircore holes was twinned; two of the March 2020 Aircore holes were twinned. • All drilling and sampling procedures were monitored on site by an independent geologist on a hole-by-hole basis. • All primary information was initially captured in a written log on site by a geologist, data entered, imported then validated and stored in a geological database. • March 2020: Additional check logging was carried by an independent geologist in Perth prior to samples being submitted to Nagrom for analysis. • No adjustments to assay data have been performed. • External review of umpire samples reported by Intertek and Bureau Veritas was carried out.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and downhole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• The position of the Aircore hole locations was determined by a Trimble R6 RTK GPS in RTK mode. The survey was carried out by Heyhoe Surveys from Geraldton. Accuracy of 0.05 m relative to SSM Dongara 49. • The position of the auger hole locations was determined by a GPS model Garmin GPS Map 64s with an accuracy of 5 m. • The CRS used was GDA94/MGA Zone 50 (ex SSM DON49). • The topography at the project site currently under exploration is flat to gentle undulating terrain. Site survey (Heyhoe Surveys) have produced a ± 50 cm DTM across the entire project area.
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.*	• The Aircore drill holes were spaced on an approximate 350–600 m (east west) x 480 m along strike (north-south) grid. • The auger drill holes were spaced on an approximate 400m (east-west) x 800 m (north-south) grid. • The adopted spacing at this time is sufficient based on the geological continuity of the sand formation being tested, and sufficient to be applied in Mineral Resource estimation. • No sample compositing of holes has been applied.
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 orientation utilised for the Aircore drilling campaign represents the entire strike length of the aeolian dune within the initial prospective target area and as such is not expected to introduce any particular bias.
Sample security	• *The measures taken to ensure sample security.*	• All samples have been bagged and removed from site and are under the care of the contract senior geologist and field sampling supervisor.

Criteria	JORC Code explanation	Commentary
		• March 2020: Aircore samples initially stored a secure facility in Welshpool where sample reconciliation was undertaken before delivery to Nagrom Laboratory. • March 2020: Aircore samples were delivered to Nagrom in Kelmscott. The laboratory carried out a sample reconciliation which was audited against the sample submission sheet. • September 2020: Aircore samples and returned samples and pulps from Intertek Genalysis are in the Welshpool facility along with chip-trays from both the March and September drill programs. • Auger samples were delivered to Intertek Maddington. The laboratory provided a sample reconciliation report which was audited against the sample submission sheet.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Guidance was provided by an independent consultant, Andrew Scogings, on sampling lengths and hole spacings who carried out a site visit to inspect the drilling and sampling operations.

JORC Table 1 – 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.*	• Miscellaneous Licence L70/219 comprises an effective land area of 10.36km^2 and was granted on 18 November 2020 for a period of 21 years. The holder is Perpetual Resources Limited. A 1% vendor royalty applies minerals sold from the Licence. • The licence area exploration is covered by Crown Land. • No impediments on a licence to operate at time of reporting.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Past exploration by others targeting heavy mineral sands. Refer to ASX release dated 6 February 2019, historical exploration.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Unconsolidated Quaternary coastal sediments, part of the Perth Basin. Aeolian quartz sand dunes overlying Pleistocene limestones and paleo-coastline.
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 – downhole length and interception depth – hole length.	• Exploration Results are not being reported here; however, drill hole information can be found in ASX release dated 1 April 2020 and 7 December 2020.

Criteria	JORC Code explanation	Commentary
	• *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.*	
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. 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.*	• Exploration Results are not being reported.
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 downhole lengths are reported, there should be a clear statement to this effect (e.g. 'downhole length, true width not known').*	• Exploration Results are not being reported.
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.*	• Refer to figures incorporated in the body of the report.
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.*	• Exploration Results are not being 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.*	• Groundwater was intersected in all holes that exceeded 10 m depth. Water table generally occurred between 10 m and 12 m. • Average in situ density (dry) determined to be 1.64 t/m^3 from six sites. Density locations were hand excavated to 0.4 m deep. The Instrument used was an Instrotek model Explorer. Tests were performed by Western Geotechnical & Laboratory Services. • For the March 2020 program particle size distribution analysis was carried out on eight representative samples. Tests were undertaken by Western Geotechnical & Laboratory Services. • Previous metallurgical testwork was undertaken by Nagrom to establish possible process methods to provide a beneficiated product. Refer to ASX releases of 30 January 2020 and 24 February 2020.

Criteria	JORC Code explanation	Commentary
		• Petrological examination by Paul Ashley undertaken and reported on 18 February 2020. • An approximate two tonnes bulk sample from the March Aircore drilling was process tested by IHC Robbins with results received in December 2020. • In situ particle size distribution was determined for 12 Aircore holes from the March 2020 program south of the Mount Adams Road and for six holes from the September 2020 program to the north. The March 2020 samples were tested using a dry sieving method by Diamantina Laboratories, Malaga and the September 2020 samples were tested by Nagrom, Kelmscott using a wet screening method. • In situ particle size is predominantly within the range of 0.15 mm to 0.6 mm. • About 70% of the sand grains are between 0.125 mm and 0.6 mm. • Calculated AFS numbers for the March 2020 samples are predominantly in the range 40–50. • The sands appear to become finer grained with depth. This is illustrated by P50 which decreases from about 400 µm to 300 µm for the March 2020 samples. • The September 2020 aircore results are generally finer than the March 2020 aircore samples. It appears that there is a general trend of decreasing grain size going north. • The apparently finer size of the September 2020 samples may be due to the wet screening method used, compared with dry screening for the March 2020 samples. Wet screening is likely to be more efficient than dry screening. • Snowden is of the opinion that the PSD results from both programs need verification, by umpire testing of September 2020 Nagrom samples at Diamantina. Twins 20B019 and 20B032 should be included for testing at both Robbins and Nagrom. Infill holes should also be tested for PSD.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth 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.*	• The Company will carry out further metallurgical testwork.

JORC Table 1 – Section 3: Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Selected checks by Snowden of drill hole data against original assay certificates were completed with no errors identified. • Statistical checks completed to ensure all assays fall within acceptable limits. • Checks on overlapping or duplicate intervals completed. • Checks were completed on all samples which fell below analytical detection limits to ensure samples were assigned half detection limit grades in estimation.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person, Andrew Scogings, visited the site during the Aircore drilling program in March 2020.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• Snowden believes the local geology is well understood as a result of work undertaken by Perpetual and other companies working in the region. • Surfaces of the sand layers were interpreted based on a combination of geochemistry and the geological logging. Each layer was treated as a hard boundary for resource modelling. • Alternative interpretations of the mineralisation are unlikely to significantly change the overall volume of the layers in terms of the reported classified material.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The deposit has an extent of approximately 7.1 km north-south x 1.9 km east-west in the south and 1.2 km east-west in the north. • The deposit is restricted by tenement boundaries and the Yardanogo Nature Reserve in the west. • The deposit is open outside of these limits.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).*	• Ordinary kriging estimation using a parent cell size of 200 mE x 240 mN x 2 mRL to estimate for SiO_2, Al_2O_3, TiO_2, Fe_2O_3 and LOI. • Sample selection honoured geological domains which were developed considering the vertical chemical and geological trends of the profile. Five layers were modelled: Yellow, White Upper, White Lower, Light Grey Pod, Grey Pod and Grey. • Statistical analysis by domain was completed. Top cuts were applied to some elements in some layers where appropriate to control sporadic extreme values during estimation; however, no top cut was applied for SiO_2. • Variography was completed for all elements. Due to the low number of samples for individual layers, data was combined for variogram modelling.

Criteria	JORC Code explanation	Commentary
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Correlations were largely maintained by using similar estimation parameters. Validation of block estimates included visual and statistical checks, both global and local. Checks were completed against original and de-clustered drill hole samples. The validations show that while smoothed, the block estimates reproduce the trends observed in the drill hole data.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• All tonnages have been estimated as dry tonnages.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• No cut-off parameters have been applied as the yellow and white sand being reported 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	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• It is assumed that the deposit will be mined using conventional open cut mining methods. • No assumptions regarding minimum mining widths and dilution have been made. • No mining has occurred.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Eight composites were made of three sand types from the 2020 Aircore drill program and tested for particle size distribution at Western Geotechnical in Welshpool during April 2020. The samples were described as light grey-white sand, grey clayey sand and yellow sand. The in situ particle size distribution is fairly consistent irrespective of the type of sand, with approximately 85% of the sand between 0.15 mm and 0.6 mm. •

Criteria	JORC Code explanation	Commentary
		• **Auger hole composite** - a composite sample weighing 178.6 kg from nine shallow auger holes drilled in 2019 was submitted to Nagrom of Kelmscott, WA for process testwork which was reported in February 2020. The process flowsheet included screening at 1 mm, washing, attritioning, spiral separation, medium intensity magnetic separation, acid leaching and calcination. Gravcon Consultancy PL was commissioned by Perpetual in June 2020 to review the Nagrom results and the following notes are derived from the Gravcon report. The percentage of SiO_2 in the samples increased during the test process while Fe_2O_3, TiO_2, $Al2O_3$ and LOI decreased relative to the head grade. 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 in the light and middlings fractions. Magnetic separation indicated that the largest fraction of SiO_2 was in the middlings and non-magnetic fractions. Acid leach tests showed that hydrochloric acid reduced Al_2O_3 and Fe_2O_3. Repeat leaching had minimal impact and the use of sulphuric acid alone or combined with hydrochloric acid had minimal impact. Calcination tests indicated limited improvement to product quality. Examples of SiO_2 and Fe_2O_3 results for each process stage are summarised as:

Process stage	SiO_2% (XRF)	Fe_2O_3% (XRF)
Feed -1mm	99.037	0.127
Deslimed +75 micron	99.297	0.111
Spiral lights + middlings	99.594	0.045
MIMS non-magnetics	99.647	0.030
HCl leach	99.746	0.009

Criteria	JORC Code explanation	Commentary
		• **Two-tonne aircore composite**: Perpetual supplied approximately 2 tonnes of sand samples from the March 2020 aircore drill program to IHC Robbins of Brisbane for process tests during the second half of 2020. The 2-tonne bulk sample was composed of approximately 10% yellow sand and 90% white sand from holes drilled in March 2020 south of the Mount Adams Road. The samples were selected based on a lower grade cut-off of 98% SiO_2, to a maximum depth of 10 m, above the water table. The composite sample was screened and deslimed by a typical mineral sands FPP to remove coarse particles, -75 µm fines and organic content. The as-received sample was processed through the FPP which consisted of a vibrating screen to remove oversize (+1mm) particles followed by a hydro-cyclone to remove slimes (-75 µm). This rejected 1.1% of the feed to oversize and 1.4% to slimes. The bulk sand sample generated from the FPP was processed through a spirals GCP to produce a HMC reject stream (spiral concentrate), and a silica-rich product stream (spiral tailings). Samples of the silica-enriched spiral tailings were tested by attritioning and HAL. It was concluded that attritioning at 78% solids, for varying residence times up to nine minutes, did not significantly improve contaminant levels and that an attritioning stage was not justified. Bulk WHIMS non-magnetic material was processed through an up-current classifier (UCC) to remove fine particles and produce a primary product described by Perpetual as Beharra Premium. A final classifying screen at 600 µm was added to make coarse product (Beharra #27) and fine product (#46). The three potential products generated contain between 99.6–99.7% SiO_2, 1495–1825 ppm Al_2O_3, 235–280 ppm Fe_2O_3, and 300–375 ppm TiO_2. • The in-situ PSD and process testwork indicates that the Beharra deposit may be suitable for the production of silica sand for markets such as glass, ceramics and foundry.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• It is assumed that no environmental factors exist that could prohibit any potential mining development at the deposit.

Criteria	JORC Code explanation	Commentary
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vughs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Six in situ bulk density measurements were completed by Western Geotechnical and Laboratory Services using a nuclear densometer and reported on 16 April 2020. The sites were sampled in accordance with AS 1289.1.2.1-6.5.1 and tested in accordance with AS 1289.2.1.1. and AS 1289.5.8.1. The results from the seven measurements are corrected based on the measured moisture factor. The dry density ranged from 1.57 t/m^3 to 1.68 t/m^3 with an average dry in situ density result of 1.64 t/m^3 which was applied to the estimate. • The CP is of the opinion that the bulk density determined using recovered sample weight, and nominal Aircore or vacuum hole diameter, supported the results from the nuclear densometer method (1.64 t/m^3) and the loose and tapped methods (1.66 t/m^3). Based on all data, an average density of 1.64 t/m3 as determined by the nuclear densometer has been assumed for the project.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The Mineral Resource was classified based on data quality, sample spacing, grade continuity, geological continuity of the domains and metallurgical/process test results into Inferred material. The grey sands are considered uneconomic at this stage and have been excluded. The reported Mineral Resource does not include any material within the Yardanogo Nature Reserve which occupies a strip approximately 300 m wide on the western side of the tenement and excludes a buffer of 50 m south and north of Mount Adams Road. • The Mineral Resource classification appropriately reflects the view of the Competent Person.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Snowden is not aware of any independent reviews of the Mineral Resource estimate. • Snowden's internal review process ensures all work meets quality standards.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*	• The Mineral Resource has been validated both globally and locally against the input sample data. • Estimates are considered to be accurate to a level which supports mine planning - Indicated. • There is no operating mine at the project, and as such, no production data is available.

Criteria	JORC Code explanation	Commentary
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	