Australian Securities Exchange Notice

24 July 2019 ASX: ILU

ENEABBA MINERAL SANDS RECOVERY PROJECT
UPDATED MINERAL RESOURCE ESTIMATE

Iluka Resources Limited (Iluka) is pleased to announce an updated Mineral Resource estimate for the Mineral Separation Plant (MSP) By-Product Resource which supports the Eneabba Mineral Sands Recovery Project, reported in accordance with the guidelines of the JORC Code (2012 edition). The Mineral Resource is located within the historical Eneabba mine void and represents a long-term accumulation of by-product material from processing at Iluka's Narngulu MSP.

Following additional testing and assessment, the MSP By-Product Mineral Resource is estimated to contain a total Mineral Resource of 1.0Mt with a Heavy Mineral (HM) grade of 82.7%, to contain 827kt of HM. The Mineral Resource consists of:

- Measured Resource of 0.84Mt grading 83.7% HM; and
- Indicated Resource of 0.16Mt grading 77.5% HM.

This represents a 107% increase in the contained HM tonnage over the previously reported Inferred Mineral Resource estimate of 0.40Mt grading 86.2% HM[1] (previously referred to as 'Monazite Stockpile').

The MSP By-Product Mineral Resource contains high levels of monazite compared to traditional HM deposits. Monazite is a heavy mineral containing the rare earth elements neodymium, praseodymium, cerium and lanthanum, which are used in a range of applications including in the manufacture of permanent magnets for use in electric motors (eg. in electric vehicles) and wind turbines.

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[1] Refer to ASX Release, "Updated Mineral Resource and Ore Reserve Statement" 21 February 2017 (page 91 – "Monazite Stockpile").

Updated MSP By-Product Mineral Resource Estimate - Overview

The MSP By-Product Mineral Resource was previously reported to the ASX on the 20th February 2017 in "Updated Mineral Resource and Ore Reserve Statement" and comprised an Inferred Mineral Resource of 0.40Mt of HM hosted in 0.46Mt of material grading 86.2% HM[1].

The MSP By-Product Mineral Resource is located 8 km south-south-east of the Eneabba Town site within the historically mined South Tails area.

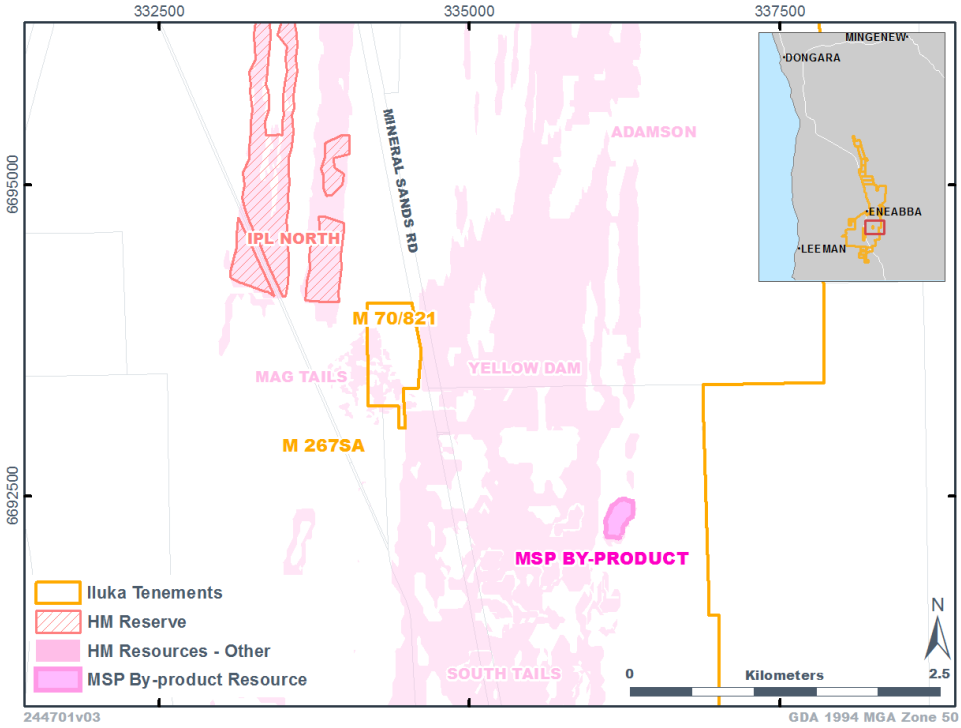


Figure 1: Eneabba summary plan showing the MSP By-Product Mineral Resource in relation to current infrastructure and HM Mineral Resources

In 2010, Iluka drilled 49 holes for 458.2m on the MSP By-Product Mineral Resource. In 2018 a further 305 drill holes were completed for 3974.5m, all of which were included in the updated Mineral Resource estimate (Figure 2).

The updated Mineral Resource estimate for the MSP By-Product Mineral Resource, broken down by Resource Category, is presented in Table 1 below.

Table 1: Mineral Resource summary for the MSP By-Product Mineral Resource, reported in accordance with the guidelines of the JORC Code (2012 Edition).

Mineral Resource Category	Resource Tonnes[1]	In situ HM Tonnes	HM	Slimes	Mineral Assemblage in HM[2]			
					Zircon	Monazite	Xenotime	Ilmenite
	(Mt)[2]	(Mt) [(4)]	(%)	(%)	(%)[5]	(%)	(%)	(%)
Measured	0.84	0.70	83.7	3.1	26	20	1.2	33
Indicated	0.16	0.12	77.5	3.8	28	15	1.2	37
TOTAL[3]	**1.0**	**0.83**	**82.7**	**3.2**	**26**	**20**	**1.2**	**34**

Notes:
(1) In situ (dry) metric tonnage is reported.
(2) The mineral assemblage is reported as a percentage of the HM.
(3) Rounding may generate differences in the last decimal place.

[1] Refer to ASX Release, "Updated Mineral Resource and Ore Reserve Statement" 21 February 2017 (page 91 – "Monazite Stockpile").

This represents a net increase of 0.43Mt of contained HM (based on the Measured Resource and Indicated Resource grade and tonnages set out above) compared to the previous estimate of 0.40Mt of contained HM (based on an Inferred Resource of 0.46Mt grading 86.2% HM)[1]. The increase is attributed to continued accumulation of by-product material since 2010 (an additional 0.27Mt of HM) and via expanding the drilling footprint (an additional 0.15Mt of HM).

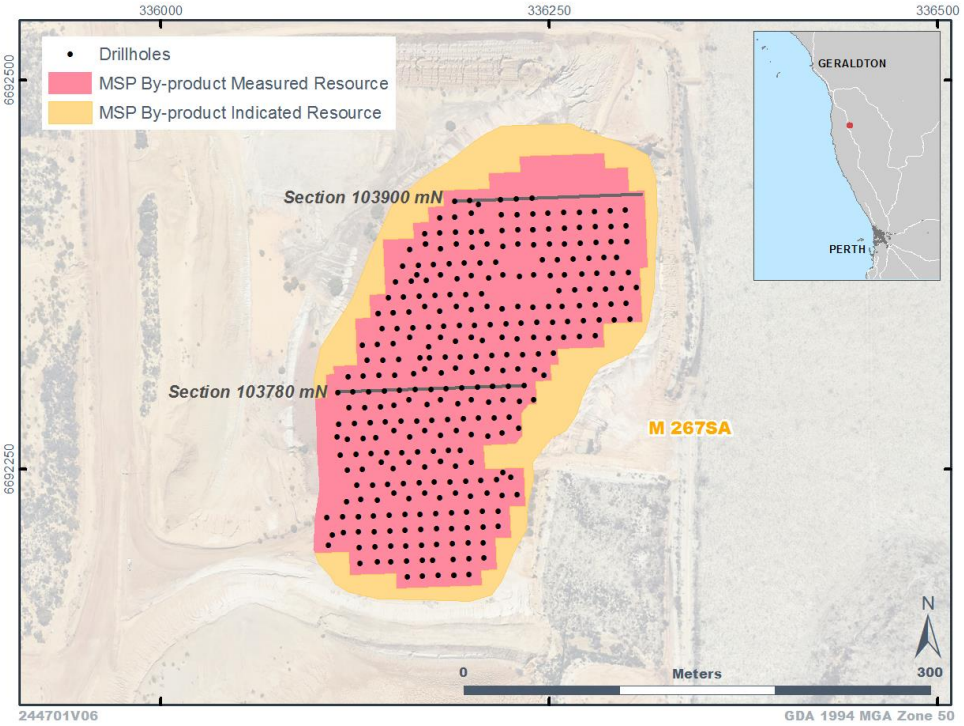
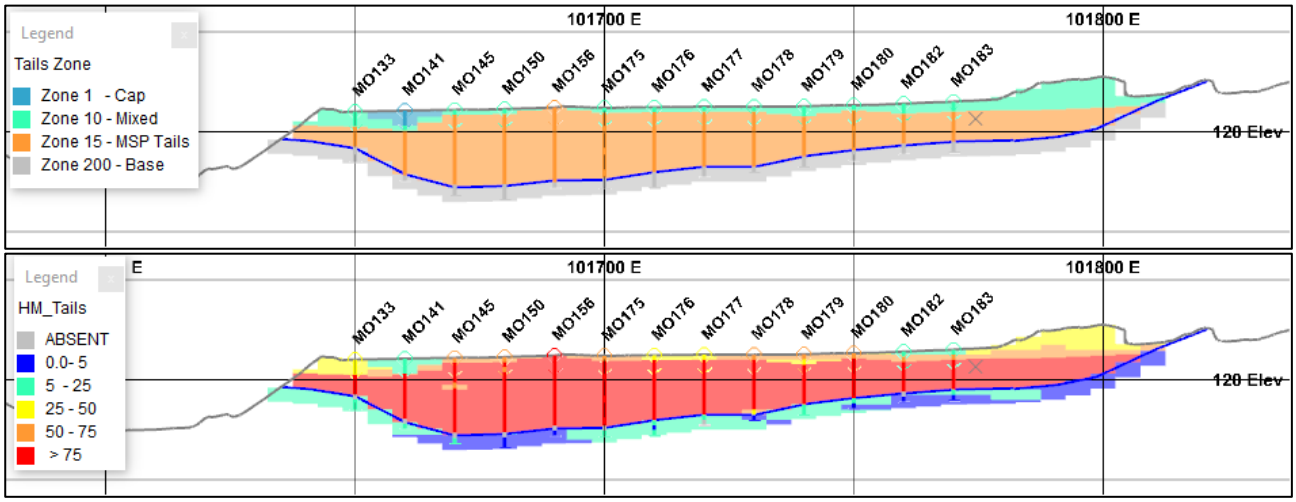


Figure 2: MSP By-Product Mineral Resource drill collar locations and JORC Category distribution. The locations for cross section 103780mN (Figure 3) and 103900mN (Figure 4) are shown.



[1] Refer to ASX Release, "Updated Mineral Resource and Ore Reserve Statement" 21 February 2017 (page 91 – "Monazite Stockpile").

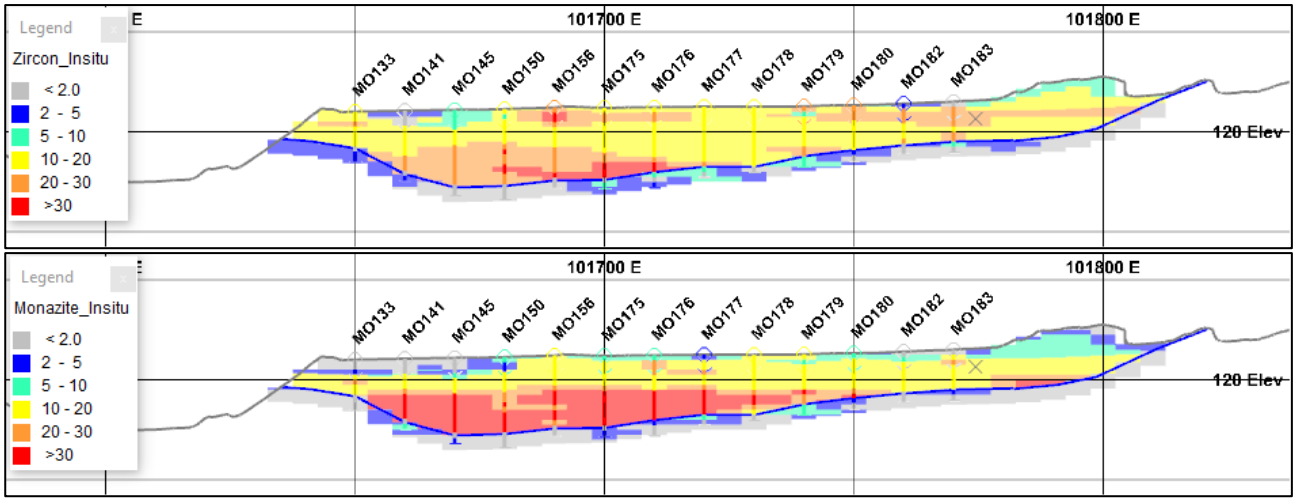


Figure 3: MSP By-Product Mineral Resource drill hole and block model section at 103780mN showing model zone, HM by-product grade, in situ zircon content and in situ monazite content.

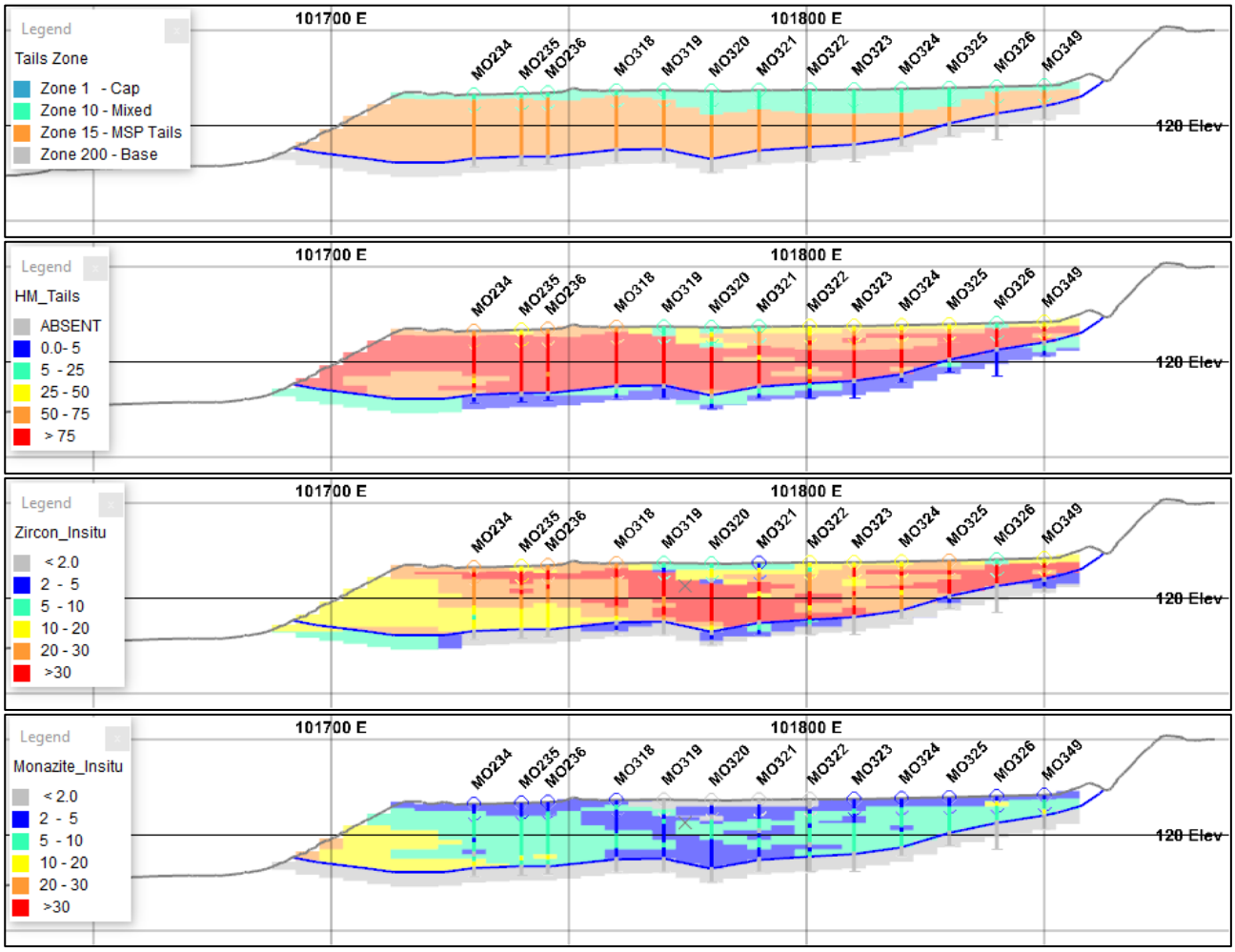


Figure 4: MSP By-Product Mineral Resource drill hole and block model section at 103900mN showing model zone, HM by-product grade, in situ zircon content and in situ monazite content.

MSP By-Product Mineral Resource - Summary of Reporting Criteria

As per ASX Listing Rule 5.8 and the 2012 JORC reporting guidelines, information material to the MSP By-Product Mineral Resource estimate is summarised below. For more detail please refer to the JORC Code Table 1, Sections 1 to 3 in Appendix 1.

Deposit geology and interpretation

By-product material from the Narngulu MSP, located east of Geraldton, has been stockpiled at Eneabba since the early 1990s. At the time, demand for the by-product declined and Iluka (and predecessor companies) resolved to store a mineral sands concentrate with high monazite credits in anticipation of a resurgence in demand. The monazite contains valuable Rare Earth Elements (REE) which are now in demand for a range of modern technology applications.

Being a stockpile there is no geological structure. The stockpile physically presents as a body of fine grained sand, approximately 300m in length, 150m wide, varying from 1 to 15m in thickness. The fine grained, dark brown to black material is easily distinguishable from the underlying yellow clayey sand. A half to one metre cap of orange brown, gravelly, clayey sand covers the resource. A mixed zone of the by-product and capping immediately below the capping with high HM grade in combination with elevated slimes and oversize is recognised, being defined in the resource estimation and reporting.

While there is considerable variation in the HM assemblage, large areas of the by-product have a consistent character which is interpreted to reflect the campaign processing of material from mine sites through the Narngulu MSP.

Data storage

Data supporting the Mineral Resource estimate for the MSP By-Product Mineral Resource are stored in acQuire GIM Suite, a geological data management system designed and licensed by acQuire Technology Solutions Pty Ltd.

Drill technique and hole spacing

Reverse Circulation Air Core (RCAC) drilling was carried out on a regular 10x10m hole spacing using either Iluka owned and operated drill rigs or suitably qualified contract drilling companies. Initial drilling was completed at 20x20m hole spacing using Iluka owned and operated drill rigs in 2010. Subsequent infill and extension drilling at 10x10m centres was completed by Hornet Drilling and Geological Services during 2018.

Table 2 summarises the drilling carried out on the MSP By-Product Mineral Resource.

Table 2: Drill summary supporting the MSP By-Product Mineral Resource estimate.

Year	Holes	Hole Diam.	Metres	Samples	Duplicate Samples	Standard Samples	Twinned Holes
2010	49	BQ	458.2	479	25	12	3
2018	305	NQ	3974.5	3792	97	94	9
Total	**354**		**4432.7**	**4271**	**122**	**106**	**12**

Geological logging

All sample intervals were panned and logged qualitatively in accordance with Iluka standard operating procedures at the time of drilling. The main geological criteria recorded include:

- indicative sample quality;
- colour, grainsize and sorting attributes;
- main lithology and subordinate lithology;
- lithological qualifier; and
- visual estimates of HM content, slime and induration (2010 drilling only).

Sampling and sub-sampling techniques

All drill holes were sampled at 1 m intervals using a rotary splitter mounted on the drill rig cyclone. For the 2010 drilling, a 25% split was taken for sample analysis with the remaining 75% retained for metallurgical test work. For the 2018 drilling a 15% split was set to collect a sample of approximately 1.5 kg.

Sample analysis method - HM

All samples were analysed at Iluka's Narngulu Laboratory. Samples were dried and weighed, then soaked in water with 5gm/L TSPP for 24hrs prior to attritioning for 5 minutes at 250rpm. The slurry was then wet sieved at 2mm and 53µm with the +2mm fraction being recorded as oversize and the -53µm underflow calculated as the slimes content.

A subsample of approximately 50 grams of the 53um to 2mm "sand" was then split at 710µm to determine the portion of "coarse sand". HM content was determined by LST heavy media separation of the +53µm-710µm fraction at a density of 2.85g/ml.

Sample analysis method – mineral assemblage

Whole sample elemental analysis was performed on the HM fraction for every sample to assist in determining the mineral assemblage. The 2010 HM sinks were analysed by X-Ray Fluorescence Spectrometry (XRF) at Iluka's Narngulu Laboratory. 673 HM samples from the 2018 exploration were analysed at Bureau Veritas Laboratory in Perth, using a combination of XRF and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA ICP-MS), and 2543 samples were analysed by XRF at Iluka's Capel Laboratory.
Mineral species content was determined by the following element deportment formulas:

- Zircon = 1.488 * ZrO_2%
- Monazite = 3.174 * CeO_2%
- Xenotime = 2.041 * Y_2O_3%
- Staurolite = 1.818 * Al_2O_3%
- Ilmenite = TiO_2% + Fe_2O_3% +Mn_3O_4% – (Staurolite * 0.094)
- Others = 100 – (Zircon +Monazite + Xenotime + Ilmenite + Staurolite)

Estimation methodology

The resource modelling and estimation for the MSP By-Product Mineral Resource were performed in Datamine Studio RM. Open wireframe surfaces were created by interpreting data along drill sections to guide the definition of zones applied to the model cells.

The model block dimension adopted is 5x5x1m (XxYxZ) with an allowance for sub-celling down to 2.5x2.5x0.1m cell dimensions to provide volume definition at domain interfaces. The parent cell dimension is about half of the modal 10x10m drill spacing with parent cells centred on drill holes and allowing for a "floating cell" positioned along and across strike between drill holes.

The grade estimation was done using Inverse Distance cubed (ID^3) for all analytes. As no meaningful grade orientation is present in the mineral sands by-product material, a circular search volume, flattened in the Z dimension of 30x30x2m was adopted. The search volume was increased by factors of 2 and 3 to inform model cells not assigned values in the primary search. The interpolated grades were compared to the drill hole grades, both visually and statistically, with the model grades providing an acceptable representation of the drill hole grades.

Iluka's standard bulk density formula, developed internally from the studies of various materials mined and HM concentrates, was used. A relatively high density averaging 2.4t/m^3 is estimated by the formula which is in line with the expectations for heavy mineral concentrate containing minerals with high specific gravity.

Cut-off grade

A cut-off grade was not applied to the MSP By-Product Mineral Resource as the high average HM grade places all material within the realm of economic viability. The resource estimate was restricted to material interpreted as *bona fide* mineral sands by-product.

Resource classification assignment

The Mineral Resource Estimates are classified and reported in accordance with the guidelines of the JORC Code (2012 edition). The resource category applied is based on:

- drill hole spacing and sample density;
- density and confidence in the analytical data supporting the assemblage determination;
- whether the data supporting the resource estimate has been acquired using industry standard methods or better;
- established grade continuity; and
- an understanding of the material stored at the MSP By-Product Mineral Resource which represents specific by-products from the Narngulu MSP.

On this basis the MSP By-Product Mineral Resource was classified as Measured or Indicated. Distribution of categories is shown in Figure 2.

Mining and metallurgical methods and parameters

The MSP By-Product Mineral Resource is characterised by fine, even grained sand and effectively represents a high value heavy mineral concentrate (HMC). As the material has been recovered by conventional mineral sand recovery technology, it is expected that any further processing will result in very high HMC recoveries. Only a simplistic treatment process is envisaged to remove a minor amount of contaminating slime and sand, mostly associated with the capping material. The material is unconsolidated and can easily be excavated by standard earth-moving equipment. Large portions of the MSP By-Product Mineral Resource are represented by clean HM and direct shipping may be possible.

Competent Person statement

The information in this report that relates to Mineral Resource estimates is based on, and fairly represents, information and supporting documentation prepared by Mr Brett Gibson, a permanent employee of Iluka.

Mr Gibson is a member of the Australian Institute of Geoscientists (AIG) and he has sufficient experience relevant to the style of mineralisation and the type of deposits under consideration and to the activity being undertaken to be considered a Competent Person as defined in the 2012 Edition of the “Australian Code for reporting of Exploration Results, Mineral Resources and Ore reserves”. Mr Gibson consents to the inclusion, in this release, of the matters based on the information, in the form and the context in which they appear.

Appendix 1: JORC Code 2012 edition – Table 1 Commentary

Section 1 Sampling Techniques and Data (MSP By-Product Mineral Resource)

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

Criteria	Commentary
Sampling techniques	The MSP By-Product Mineral Resource was sampled using BQ (49 holes) and NQ (305 holes) diameter Reverse Circulation Air Core (RC-AC) drill holes. A total of 4432.7m has been drilled utilising 1m length sampling from a rotary splitter chute. All holes were drilled vertically, which is essentially perpendicular to the mineralisation. Material is presented to a rotary splitter that rotates at a regular speed to take a representative split. For 2010 drilling, a 25% split was taken for geological logging and sample analysis with the remaining 75% retained for metallurgical test work. For 2018 drilling, about 15% of the sample was collected for geological logging and analysis. Duplicate samples were taken from a second split at a rate of one in every 34 primary samples assayed. All exploration utilised the same drilling methodology and assay analysis techniques. RC-AC drilling was used to obtain a 1m sample from which approximately 1 kg was collected using a rotary splitter. All samples were submitted for assay. The samples were dried, de-slimed (material <53µm removed) and had oversize (material +2mm) removed. 100g of the sample was subjected to float/sink separation using Lithium-Sodium-Tungsten (SG=2.85). The sinks were dried and weighed giving the HM content. HM sinks were then analysed by XRF at internal Iluka laboratories or by a combination of XRF and laser ablation at Bureau Veritas in Canning Vale, Perth. The XRF data was used to calculate a mineral assemblage based on stoichiometric formulae and incorporated into the drill hole file prior to interpolation. Mineral species content was determined by the following formula: • Zircon = 1.488 * ZrO2% • Monazite = 3.174 * CeO2% • Xenotime = 2.041 * Y2O3% • Staurolite = 1.818 * Al2O3% • Ilmenite = TiO2 + Fe2O3% +Mn3O4% – (Staurolite * 0.094) • Others = 100 – (Zircon +Monazite + Xenotime + Ilmenite + Staurolite)
Drilling techniques	All sampling was based on vertical RC-AC drilling utilising BQ or NQ rods to bore a 52mm or 76mm diameter hole respectively.

Criteria	Commentary
Drill sample recovery	Sample quality was recorded during field logging. Any factors that affect sample recovery were recorded in the logging comments. Sample weights were reasonably consistent although poor sample recovery is evident in the interval between stockpiled material and the underlying in situ sands. RC-AC samples were visually checked for recovery, moisture and contamination and a consistent rate of penetration was maintained during drilling. Samples were not affected by the presence of rock or induration and no sample bias is evident.
Logging	Samples were logged by qualified geologists and the geological information recorded is adequate to support the Mineral Resource estimate, classification and subsequent mining studies. Detailed sample analysis also supports metallurgical interpretation. Logging of 2010 RC-AC samples recorded estimated slimes, colour, lithology, dominant grainsize, coarsest grainsize, sorting, induration type, hardness, estimated rock and estimated HM. Logging of 2018 RC-AC samples recorded colour, lithology, dominant grainsize and sorting. All samples representing 100% of the intersections for the MSP By-Product Mineral Resource were logged. Lithology was recorded for all samples drilled in the MSP By-Product Mineral Resource.
Sub-sampling techniques and sample preparation	Samples are collected beneath a rotary splitter fed from a cyclone. A 1kg representative sample was collected for geological logging and analysis. All samples are above the water table however water injection was used for dust suppression during drilling. Sample preparation is consistent with industry standard practice and is deemed appropriated for Heavy Mineral determination. Samples were dried and weighed, then soaked in water with 5ml of TSPP for at least 12 hours, followed by mild attritioning for 5 minutes. The slurry was then wet sieved to determine the portion of sand, oversize and slimes. Duplicate samples were collected from the rotary splitter at the drill rig at the same time as the primary sample. These field duplicates were collected at a rate of one sample every for 34 samples submitted for assay. Laboratory duplicate samples were riffle split at the laboratory at a rate of one sample every 25 samples submitted for assay. Duplicate assay data demonstrates good correlation ($r^2 = 0.97$). A minor of number of outliers are present which again are associated with variability at the domain margins. The sampling methodology is considered consistent with industry standard practice and appropriate for the material comprising the MSP By-Product Mineral Resource. The sample size is appropriate for the material under consideration and is supported by Gy's Theory on sampling.
Quality of assay data and laboratory tests	The assay technique utilised is appropriate for the mineralisation of the MSP By-Product Mineral Resource, considered total and is supported by decades of reconciliation of mining of other deposits delineated using the same or very similar techniques. The mineralogical evaluation processes (i.e. XRF followed by calculating mineralogy) is considered appropriate for the current level of study. This data does not contain any results generated by geophysical methods.

<table>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td></td><td>Standards were inserted in the field at a rate of one sample every 39 samples submitted for assay. Laboratory standards were also inserted at a rate of one sample every 294 samples submitted for assay. The results show no bias for HM and a very minor high bias for slimes. This bias will not have an impact on the resource estimate.

Duplicate samples were collected in the field at a rate of one sample every 34 samples submitted for assay and in the laboratory at a rate of one sample every 25 samples assayed. Duplicate assay data demonstrates good correlation however some outliers are present.</td></tr>
<tr><td>Verification of sampling and assaying</td><td>No verification of the significant results has been undertaken externally however all results have been visually checked for validity by several Competent Persons employed by Iluka.

Twin holes were completed at a rate of one twin for every 29 holes drilled. Comparisons between primary and twin hole assay data shows the material present at the MSP By-Product Mineral Resource is quite variable on a short-range basis however globally there is little variation. Most of the outliers are coincident with the transition from cap material to high grade mineral sands by-product or conversely from high grade mineral sands by-product to low grade basement.

Logging of RC-AC samples was input directly into a laptop computer using either Micromine software or acQuire logging software both with data verification routines enabled. Data was then transferred into Iluka's SQL database which incorporated further verification routines.

No bias or errors were identified in the assay data and no adjustments were made to the raw data. The mineral assemblage was calculated from XRF analysis of the HM sinks fraction.</td></tr>
<tr><td>Location of data points</td><td>The survey was completed using a 3D Terrestrial scanner in conjunction with an RTK_DGPS unit which affords an accuracy to within ±0.02m horizontally and ±0.05m vertically. Collar positions were projected to this topographic surface prior to modelling processes.

Any hole moved from the pegged collar position was re-surveyed after drilling. Topographic control is considered of high quality and adequate for the purpose.

The modelling was done in the same grid reference as the Eneabba Mine (Eneabba Mine Grid – EMG). The data is stored in the geological database with a UTM reference (WGS84 – GDA94, Zone 50). Collar survey data was re-calculated to the EMG using acQuire Software coordinate transformation based on a 2-point transformation.

<table>
<tr><th>Dataset</th><th>Local N</th><th>Local E</th><th>MGA N</th><th>MGA E</th></tr>
<tr><td>ENEABBA</td><td>107706.98</td><td>99829.8</td><td>6696150</td><td>334138.91</td></tr>
<tr><td>ENEABBA</td><td>99553.16</td><td>103508.1</td><td>6688150</td><td>338138.91</td></tr>
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</td></tr>
<tr><td>Data spacing and distribution</td><td>Drilling was conducted on a 10m x 10m drill grid which is considered appropriate for the style of mineralisation being tested.

The drilling is spaced sufficiently to conclusively demonstrate continuity of mineralisation and is appropriate for the style of mineralisation and the Mineral Resource classification applied.

No compositing was used for assay data.</td></tr>
<tr><td>Orientation of data in relation to</td><td>The MSP By-Product Mineral Resource is not considered geologically continuous due to the nature of the mineralisation present (i.e. mineralisation is associated with mineral sands by-product from Iluka’s Mineral Separation Plant). Drilling has been conducted on a regular grid to provide a representative dataset of the material under consideration and to effectively identify grade and mineralogical variation.</td></tr>
</table>

Criteria	Commentary
geological structure	No sampling bias has been identified.
Sample security	Samples were dispatched with soft copy registers of the samples being freighted. These were then verified by Iluka staff upon arrival at the laboratory. Samples were stored in secure Iluka compounds when not in transport.
Audits or reviews	No audits were conducted of sampling technique during the drilling of the MSP By-Product Mineral Resource however the sampling techniques used have since been audited for Iluka elsewhere. The same sampling and assay processes also supported Iluka's historic mining operations in Eneabba including mining of other pits.

Section 2 Reporting of Exploration Results (MSP By-Product Mineral Resource)

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

Criteria	Commentary
Mineral tenement and land tenure status	The MSP By-Product Mineral Resource forms part of the previously mined South Tails area at Eneabba some 250km north of Perth in Western Australia. The MSP By-Product Mineral Resource is located within mining lease M267SA which is held by Iluka Midwest Limited, a wholly owned subsidiary of Iluka Resources. The resource is located within Crown Reserve 31030 (South Eneabba Natural Reserve). Mining occurred on Crown Reserve after the status of reserve was awarded. No other licences for the operation of a mine have been awarded over the MSP By-Product Mineral Resource, however it is envisaged that suitable environmental management plans will be produced prior to any mining commencing which will address any environmental considerations.
Exploration done by other parties	All drilling at the MSP By-Product Mineral Resource has been completed by Iluka. No information from any other party has been used or known to exist.
Geology	The MSP By-Product Mineral Resource is located within the Perth Basin however the material is made up of mineral sands by-product from Iluka's Narngulu MSP. Being a minerals sands stockpile there is no geological structure. The stockpile physically presents as a fine grained sand and is approximately 300m in length, 150 wide and varies from 1 to 15m in thickness. The fine grained, dark brown to black material is easily distinguishable from the yellow clayey sand it resides on.
Drill hole Information	A total of 354 drill holes have been used in resource estimation, comprising a total of 4,120 sample points of which 4,115 were assayed. 225 assay values which represented a mix of mineral sands by-product and basement material from sampling through domain boundaries were set to absent for the grade interpolation to minimise any effect that these mixed grade samples would impart. It is impractical to list all the mineralised intercepts and this information is deemed to be largely superseded by the Mineral Resource estimates provided which considers all the exploration data. Representative cross sections showing model Zone, HM grade, in situ zircon and in situ monazite grades are given in Figures 2, 3 and 4 of this public report.
Data aggregation methods	No weighting has been applied in the reporting of exploration results for the MSP By-Product Mineral Resource and is not considered appropriate for reporting in mineral sands. No lower HM cut-off grade was applied as the material has an extremely high HM grade. It is impractical to list all the mineralised intercepts and this information is deemed to be largely superseded by the Mineral Resource estimates provided which considers all the exploration data. Representative cross sections showing model Zone, HM grade, in situ zircon and in situ monazite grades are given in Figures 2, 3 and 4 of this public report.
Relationship between mineralisation widths and intercept lengths	The drilling has been conducted over the by-product stockpiles which have no geological structure or particular mineral orientation. As a result the drilling is considered to be essentially perpendicular to the mineralisation so all intercepts are deemed to represent true widths.

Criteria	Commentary
Diagrams	Plans and representative cross sections through the MSP By-Product Mineral Resource are given in Figures 2, 3 and 4 of this public report.
Balanced reporting	The results of the exploration are not reproduced here due to the large number of drill holes and it is considered the resource estimation effectively represents all the dataset.
Other substantive exploration data	XRF analysis has also been completed on all samples which has been used to calculate the mineral assemblage present. This provides a comprehensive data set to support the Mineral Resource estimate, mineral assemblage and inherent variability. The density used in the Mineral Resource estimate is based on the standard Iluka bulk density formula derived from the study of several deposits and material types, including HM concentrate, mined in Western Australia. The average density of the mineral sands by-product is 2.4t/m^3 which is in-line with the expectations for material containing such a high content of HM. No potentially deleterious or contaminating substances have been identified in the MSP By-Product Mineral Resource that would affect product saleability. It is envisaged that material from the MSP By-Product Mineral Resource will be sold as a concentrate with minimal processing.
Further work	No further work is anticipated though further drilling may be warranted if further by-product material is added to the stockpile. The current drilling and survey data have effectively defined the extent of the by-product material and no further extensions exist.

Section 3 Estimation and Reporting of Mineral Resources (MSP By-Product Mineral Resource)

(Criteria listed in section 1, and section 2, also apply to this section.)

Criteria	Commentary
Database integrity	Logging of RC-AC samples was captured on a laptop computer using either Micromine software with data verification routines enabled or MS Excel spreadsheet. Data was then transferred into Iluka's acQuire hosted GIM database which incorporates additional validation routines. Drill data was reviewed statistically and visually; to ensure all results were within acceptable ranges and all drill holes were correctly spatially located.
Site visits	No site visits were undertaken during this estimation process, however several Competent Persons employed by Iluka have visited or worked at Iluka's Eneabba Mine Site. No issues were raised as a result of these visits.
Geological interpretation	By-product material from Ilukas' Narngulu MSP, which is located east of Geraldton, has been stockpiled at the current location since the early 1990's. Being a stockpile there is no geological structure. Stratigraphically, the stockpile comprises a half to one metre cap of orange brown, gravelly, clayey sand which covers the Mineral Resource. A mixed zone of mineral sands by-product and capping is immediately below the capping which is characterised by high HM grades in combination with elevated slimes and oversize. The degree of mixing is likely overstated due to contact of the clean mineral sands by-product and cap material being obscured by the 1m drill sample length. Beneath this mixed zone is the mineralised unit which presents as a dark brown to black, well sorted fine grained sand. The mineralised unit is characteristically very high in HM and low in slimes and oversize. The mineralised unit is easily distinguishable from the underlying in-situ yellow clayey sand. All relevant information has been sourced from the drill samples. Some mineralisation is contained in the underlying clayey sand but this material has been excluded from the Mineral Resource estimate for the MSP By-Product Mineral Resource. No alternative interpretations have been considered at this time with the material being treated as a single stockpile. Granularity is provided by the close spaced drilling and XRF analysis being done on every sample. Appropriate domaining and corresponding flagging of drill data has been used to control the estimation of grade during interpolation. The MSP By-Product Mineral Resource, representing a stockpile, does not have geological continuity. While there is considerable variation in the HM assemblage, large areas of the mineral sands by-product have a consistent character which is interpreted to reflect the campaigning of mineral from mine sites feeding the Narngulu MSP.
Dimensions	The stockpile physically presents as a fine grained sand and is approximately 300m in length, 150m wide and varies from 1 to 15m in thickness.
Estimation and modelling techniques	The grade interpolation was carried out using the Estima Superprocess within Datamine Studio software. Grade and XRF data estimation was completed using Inverse Distance Cubed (ID3), and is considered appropriate for this style of mineralisation. No HM top-cut has been used nor deemed necessary. Drill hole sample data was flagged with domain codes corresponding to the "stratigraphy" of the stockpile and the domains imprinted on the model from 3-dimensional surfaces generated from the stratigraphic interpretations. A primary search dimension of 15*15*2m (X*Y*Z) was

Criteria	Commentary
	used for all data. Successive search volume factors of 2 and 3 were used to interpolate grade in areas of lower data density not assigned a grade in the primary search. A comparison estimate was undertaken using the Nearest Neighbour grade interpolation method. This correlated well with the ID3 interpolation and gave a very similar global estimate of grade and tonnage. Metallurgical test work is ongoing to optimise the recovery of valuable HM from the MSP By-Product Mineral Resource. Beneficiation may be able to produce higher value products, concentrated with specific minerals to suite market demand. No deleterious elements have been identified or included in the resource estimation. At time of resource estimation it has been assumed that the stockpiled HM would be sold as a mineral concentrate with minimal processing. A parent cell size of 5*5*1m with 1*1*10 (X*Y*Z) cell splitting has been adopted which is considered appropriate given the approximate drill spacing of 10m*10m*1m (X*Y*Z). A search radius of 15*15*2 has been used in conjunction with 2*2*1 (X*Y*Z) cell discretisation to estimate the grade into model cells. No selective mining units were assumed in this estimate. No correlation between variables has been considered. Appropriate domaining and corresponding flagging of drill data and model cells has been used to control mineralisation estimation during resource estimation. The resource estimate for the stockpile has been restricted to reporting from domains representing mineral sands by-product material. A top cut was not deemed necessary for the HM assays. The MSP By-Product Mineral Resource has a low coefficient of variation negating any requirement for grade cutting. Validation of the model was done by comparing model statistics to drill data statistics, visual comparison of drill and model grades and completing a comparison of the Inverse Distance interpolation against a Nearest Neighbour interpolation. The validation process confirmed the grade interpolation. No reconciliation data is available.
Moisture	The tonnages are estimated on a dry basis using an Iluka developed density formula. The formula is considered appropriate and has been used in other historically mined mineral sands deposits.
Cut-off parameters	No cut-off grade has been applied to the MSP By-Product Mineral Resource as the high HM grade means all the material will effectively be economic providing sales contracts can be secured. Rather the reported Mineral Resource was restricted to material interpreted as bona fide mineral sands by-product.
Mining factors or assumptions	The material is unconsolidated and can easily be excavated by standard earth-moving equipment such as front end loader or truck and shovel. Large portions of the MSP By-Product Mineral Resource are represented by clean HM and direct shipping may be possible. Feasibility studies are currently in progress which will determine the economic viability and address the approvals required to facilitate extraction.
Metallurgical factors or assumptions	The MSP By-Product Mineral Resource is characterised by fine, even grained sand and effectively represents a high value Heavy Mineral Concentrate (HMC). As the material has historically been recovered by conventional mineral sand recovery technology, it is expected that any processing to enhance the concentrate will result in very high recoveries. Only a simplistic treatment process is envisaged to remove a minor

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	amount of contaminating slime and sand, mostly associated with the capping material.
Environmental factors or assumptions	All native title agreements are in place for M267SA. Native vegetation is present in the surrounding area however the MSP By-Product Mineral Resource is located within a previous mine void and no native vegetation is impinging on the deposit. Environmental Management Plans are currently being prepared and will need the relevant statutory approval prior to any mining commencing which will address any environmental considerations. Above background radioactivity levels are present in the stockpile material due to the presence of monazite. Feasibility studies are currently in progress and an approved Radiation Management Plan (RMP) will be developed and implemented prior to any mining commencing.
Bulk density	Iluka's standard bulk density formula, developed internally from the studies of various materials mined and HM concentrates, was used. A relatively high density averaging 2.4t/m^3 is estimated by the formula which is in line with the expectations for material containing such a high content of minerals with a high S.G. The Iluka Standard Bulk Density formula used accounts for void space and variable material composition. It is the same formula used at historical Iluka mine sites, which mined similar material. It accounts for variability in HM, slimes and sand content. The formula was determined from results of extensive Nuclear Densometer testing at various Iluka mine sites. It is assumed that the material in the MSP By-Product Mineral Resource has the same density relationship that is seen in Iluka deposits that are currently being mined or have been mined historically.
Classification	The resource category applied is based on: • drill hole spacing and sample density; • density and confidence in the analytical data supporting the assemblage determination; • the data supporting the resource estimate has been acquired using industry standard methods or better; • established grade continuity; and • an understanding of the material stored at the MSP By-Product Mineral Resource which represents specific by-products from the Narngulu MSP. Because the material under consideration comprises a Narngulu MSP By-Product Mineral, an intensive exploration program was adopted to ensure a high confidence in the volume and mineral assemblage. The drilling was conducted on a close 10m by 10m spacing. In addition every sample was subjected to float/sink analysis and the HM sinks for every mineral sands by-product sample was analysed by XRF (when done internally) or XRF in combination with laser ablation at an external laboratory. Effectively there is an assay per 250 tonnes of resource. It is the view of the Competent Person that the frequency and integrity of data, and the resource estimation methodology are appropriate for this style of mineralisation and support the Mineral Resource classification applied.
Audits or reviews	Optiro Mining Consultants (Optiro) reviewed the Mineral Resource estimate and Classification assigned to the MSP By-Product Mineral Resource. Optiro has endorsed the resource estimate and classification for the MSP By-Product Mineral Resource.

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Discussion of relative accuracy/ confidence	It is the view of the Competent Person(s) that the frequency and accuracy of the data and the process in which the Mineral Resources were estimated and reported are appropriate for the style of mineralisation under consideration. The relative accuracy of the estimates is reflected in the reporting of the Mineral Resources and the Resource Category assigned as per the guidelines set out in the JORC Code (2012 ed.). The statement refers to global estimates of tonnage and grade. No production data is available as the deposit is not in production.