

19 September 2022

## Substantial increase in Mineral Resources for the Governor Broome Heavy Mineral Sands Project

*Updated Resources for two key deposits at WA project sees Global Indicated Resources jump to 78Mt at 4.8% THM, providing a strong foundation for economic studies*

### Highlights

- > **Mineral Resources at the Jack Track Deposit increased by 21%, including:**
  - Maiden Indicated Resource of 22Mt @ 4.5% HM
  - Updated Inferred Resource of 12Mt @ 3.5% HM
- > **Global Indicated Mineral Resources at the Governor Broome Project increased by 50%, including:**
  - Updated Indicated Resource of 8.0Mt @ 5.0% HM for the Governor Broome West Deposit
- > **Global Indicated and Inferred Mineral Resource base at the Governor Broome Project increased to 126Mt @ 4.3% HM**
- > **50% increase in the higher confidence Indicated Resource to 78Mt at 4.5% HM – now 62% of the Global Mineral Resources**
- > **Substantial Resource growth highlights potential for a viable commercialisation pathway for the Governor Broome Project, with a Scoping Study now planned**
- > **Bulk Sample of mineralisation from the Jack Track Deposit to undergo Bulk Testwork by Allied Mineral Laboratories, plus an assessment of its mineral assemblage**

Astro Resources NL (ASX: ARO) (“**ARO**”, “**Astro**” or “the **Company**”) is pleased to announce a significant increase in Mineral Resources at its 100%-owned Governor Broome Heavy Mineral Sands Project in Western Australia’s South-West region.

The updated Mineral Resources, which reflect in-fill drilling of a significant portion of the Jack Track Deposit during the June Quarter 2022, include:

- a maiden Indicated Resource of 22Mt @ 4.5% HM within the portion of the Jack Track Deposit that underwent in-fill drilling during Q2 of 2022;
- an updated Inferred Resource of 12Mt @ 3.5% HM within the eastern part of the Jack Track Deposit;
- an updated Indicated Resource of 8.0Mt @ 5.0% HM for the Governor Broome West Deposit; and
- a maiden Indicated Resource of 4Mt @ 3% HM within the portion of the Jack track Southwest Deposit that underwent in-fill drilling during Q 2 of 2022.

The updated Resource represents a 50% increase in the Governor Broome Project's global Indicated Resource to 78Mt @ 4.5% HM (up from 52Mt @ 4.6% HM), as well as a 21% increase in the Jack Track Deposit total Resource to 34Mt @ 4.2% HM (up from 28Mt @ 4.1% HM), compared with the previous Mineral Resource Estimates announced to the ASX on 8 November 2021.

The resource estimations were carried out by Astro's independent consultant, Mr John Doepel, Principal Geologist of Continental Resource Management Pty Ltd ("CRM"). The revised Resources are reported in accordance with the 2012 Edition of the JORC Code and are summarised in Table 1.

**Table 1. Governor Broome Project Resources – at 2% HM lower block-cut-off grade**

Reported	Deposit	Category	1Tonnage (Mt)	HM (%)	Slimes (%)	Oversize (%)
July 22	West	Indicated	8	5	13	7.5
24th May 2021	East	Indicated	3.5	4.2	12	3.7
24th May 2021	East	Inferred	3.2	3.1	14	2.9
24th May 2021	South	Indicated	11	4.4	15	11
24th May 2021	South	Inferred	2.5	4.6	16	9.1
12th Feb. 2015	North	Indicated	30	4.9	12	8.1
<b>Total</b>	<b>Governor Broome</b>	<b>Indicated</b>	<b>52</b>	<b>4.8</b>	<b>13</b>	<b>8.5</b>
<b>Total</b>	<b>Governor Broome</b>	<b>Inferred</b>	<b>6</b>	<b>4</b>	<b>15</b>	<b>6</b>
July 22	Jack Track	Indicated	26	4	8.6	7.1
July 22	Jack Track	Inferred	13	3.5	7	3
July 22	Jack Track Northwest	Inferred	3.8	4.5	11	4.2
8 Nov. 2021	Jack Track West	Inferred	5	3.9	10	2.7
July 22	Jack Track Southwest	Inferred	22	3.8	10	4.3
<b>Total</b>	<b>Jack Track</b>	<b>Indicated</b>	<b>26</b>	<b>4</b>	<b>8.6</b>	<b>7.1</b>
<b>Total</b>	<b>Jack Track</b>	<b>Inferred</b>	<b>43</b>	<b>4</b>	<b>9</b>	<b>3</b>
<b>Total</b>	<b>Project</b>	<b>Indicated</b>	<b>78</b>	<b>4.5</b>	<b>11</b>	<b>8</b>
<b>Total</b>	<b>Project</b>	<b>Inferred</b>	<b>48</b>	<b>4</b>	<b>10</b>	<b>4</b>
<b>Total</b>	<b>Project</b>	<b>Resources</b>	<b>126</b>	<b>4.3</b>	<b>11</b>	<b>6.5</b>

<sup>1</sup>Note that the above figures have been appropriately rounded

Astro Chairman Jacob Khouri commented “*The increase in Indicated Resources from 52Mt to 78Mt reinforces our view that the Governor Broome Project is a viable Heavy Mineral Sands Project that should be capable of being commercialised in its own right. Based on the strength of this result, we will now proceed with metallurgical test work on a bulk sample of ore from the Jack Track deposit, with results from this test work to feed into a Scoping Study to support the development of the Governor Broome Project.*”

## Project Location

The Governor Broome Project is located in the south-west of Western Australia on the Scott River Coastal Plain (Figure 1). The Project is, by sealed road, located about 95km south of Busselton, 105km south of Iluka’s processing plant at Capel, and 135km from Bunbury Port and from Picton, where Doral has a heavy mineral separation plant.

A 132kV power line is located just 5km to the north and a three-phase power line passes through the Project.



**Figure 1. Project Location**

## Geology and Mineralisation

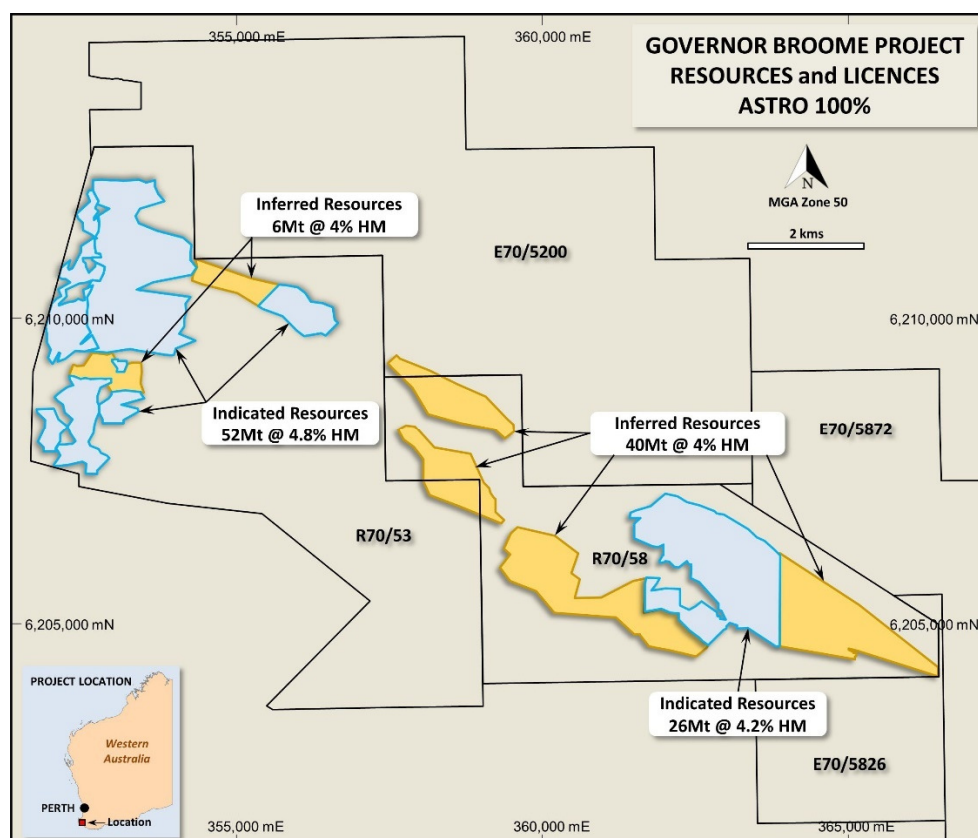
The Jack Track deposits are hosted in unconsolidated aeolian dune and underlying beach sands occurring on the Scott River Coastal Plain. The geological character of the mineralisation is like that of other heavy mineral deposits occurring along the Swan Coastal Plain, which have a long history of mining and processing. The mineralisation is hosted in beach placer facies sediments of the Pleistocene aged Barlee Shore line on the southward facing Scott Coastal Plain.

Locally, the host to the Jack Track Deposit mineralisation is the Warren Sands, which do not contain significant clay or rock. Most of the mineralisation within the other three Jack Track tenement deposits is also within the Warren Sands, but its lower portions are within the immediately unconformably underlying Beenup Beds of the Cretaceous Warnbro Group.

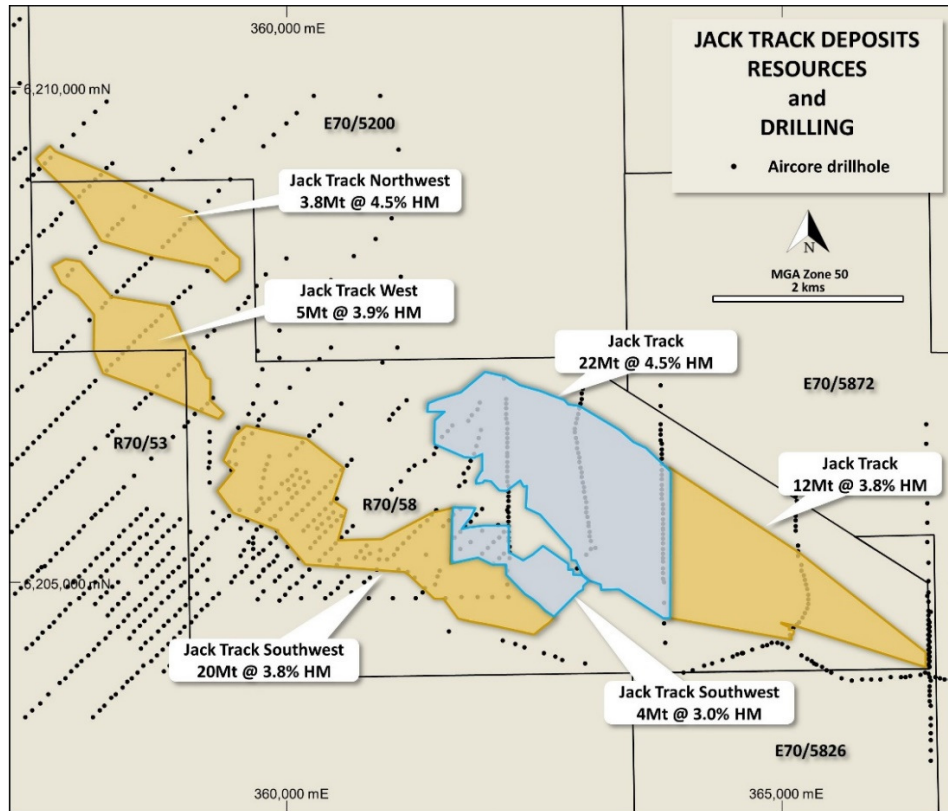
The Beenup Beds sediments are of two main facies in the area: clayey sands and organic clays. The clayey sands contain medium- to coarse-grained, angular to sub-angular, unconsolidated quartz and minor feldspar grains. The clay content, which is variable, tends to increase downward. Generally, it contains between 1% and 8% of valuable HM. Common accessory minerals are garnet, pyrite, and fine coal fragments.

The mineralisation that has been reported as Mineral Resources is based upon a minimum heavy mineral content of 2% over a thickness of 2m and a maximum Slimes content of 20% in any one intersection.

The Governor Broome Project tenements and Resources are shown on Figure 2, with the Resources and drilling within the Jack Track tenement, R70/58, shown on Figure 3.



**Figure 2. Governor Broome Project Resources and Licences**



**Figure 3. Resources in Jack Track area - Blue Indicated, Orange Inferred**

## Exploration

The Jack Track Tenement, R70/58, has been explored with air-core drilling by Metal Sands in 2007, Astro in 2012, by Iluka in 2015, and by Astro in 2022. Those holes within R70/58, or marginal to it and within the vicinity of the modelled mineralisation, are summarised in Table 2. The holes used in these revised Jack Track Deposit Resource estimations are listed in Appendix 2. Hole locations are shown on Figure 3.

**Table 2 Significant drill-holes**

Company	Years	Air-core Holes	Metres Drilled
Metal Sands	2007	265	2,600
Astro	2012	176	3,208
Iluka	2015	159	2,409
Astro	2022	314	3,520
<b>Total</b>		<b>914</b>	<b>11,737</b>

### *Drilling and sampling*

All drilling was by NQ air-core. Samples were taken of one metre intervals, after which they were selected for HM separation on the basis of the presence of visual HM. However, only 99 of the Astro holes were sent for HM separation. The other 87 Astro holes were logged, but, although many of them contained significant mineralisation, they were not despatched for analysis.

The Metal Sands and the 2012 Astro holes were predominantly drilled on 45° oriented lines that were up to 480m apart, with the holes mostly 80m apart along the lines.

The Iluka holes were drilled on five near north-south lines, with holes mostly 50m apart. Along strike, however, the lines were spaced between 800m and 1700m apart.

The 2022 drilling was designed to in-fill the earlier broad-spaced lines with lines spaced up to 160m apart. As all of the drilling was within blue-gum plantations, the orientation of the lines was dependent upon the orientations of the tree rows.

### *Sample analytical techniques*

The Metal Sands samples were analysed by Western Geolabs Pty Ltd using its standard HM analytical procedure: Remove and weigh >3.3mm fraction; split 100g sub-sample; remove -45µ slimes and +1mm oversize; obtain HM concentrate from remaining sub-sample using Tetrabromoethane ("TBE") separation (TBE SG = 2.97g/cc); report HM%, slimes%, and total oversize%.

The Metal Sands analyses were used for the Jack Track Northwest, West, and Southwest Deposits, and for the western portion of the Jack Track Deposit.

The Iluka samples were analysed at its Hamilton laboratory, where they were separated using Iluka's standard heavy media technique (Lithium Heteropolytungstate: SG = 2.85g/cc). Clay and oversize fractions were screened at sizes of -53µ and plus 710µ respectively.

Astro's 2022 samples were analysed by Western Geolabs Pty Ltd using its standard procedure, except that the clay and oversize fractions were screened at sizes of -53µ and plus 710µ respectively so that the results would be comparable to those from the Iluka holes.

Although the three methods differ, the differences will have had no significant effect on the HM content.

### *Mineral Assemblage*

Iluka carried out mineralogical testwork on 12 composite samples of HM sinks from its 2015 drilling to determine the mineral assemblage and indicative mineral quality. It reported that the assemblage of the Jack Track Deposit is ilmenite dominated and high in zircon; containing 75% ilmenite, 10.8% zircon, 6.8% leucoxene, and 2.4% rutile; for a 94% VHM content and 59.4% TiO<sub>2</sub>

## Resource Estimates

### *Estimation Methodology*

The estimates employed Inverse Distance Squared ("IS2") modelling to produce ore block models ("OBMs") of the HM mineralisation.

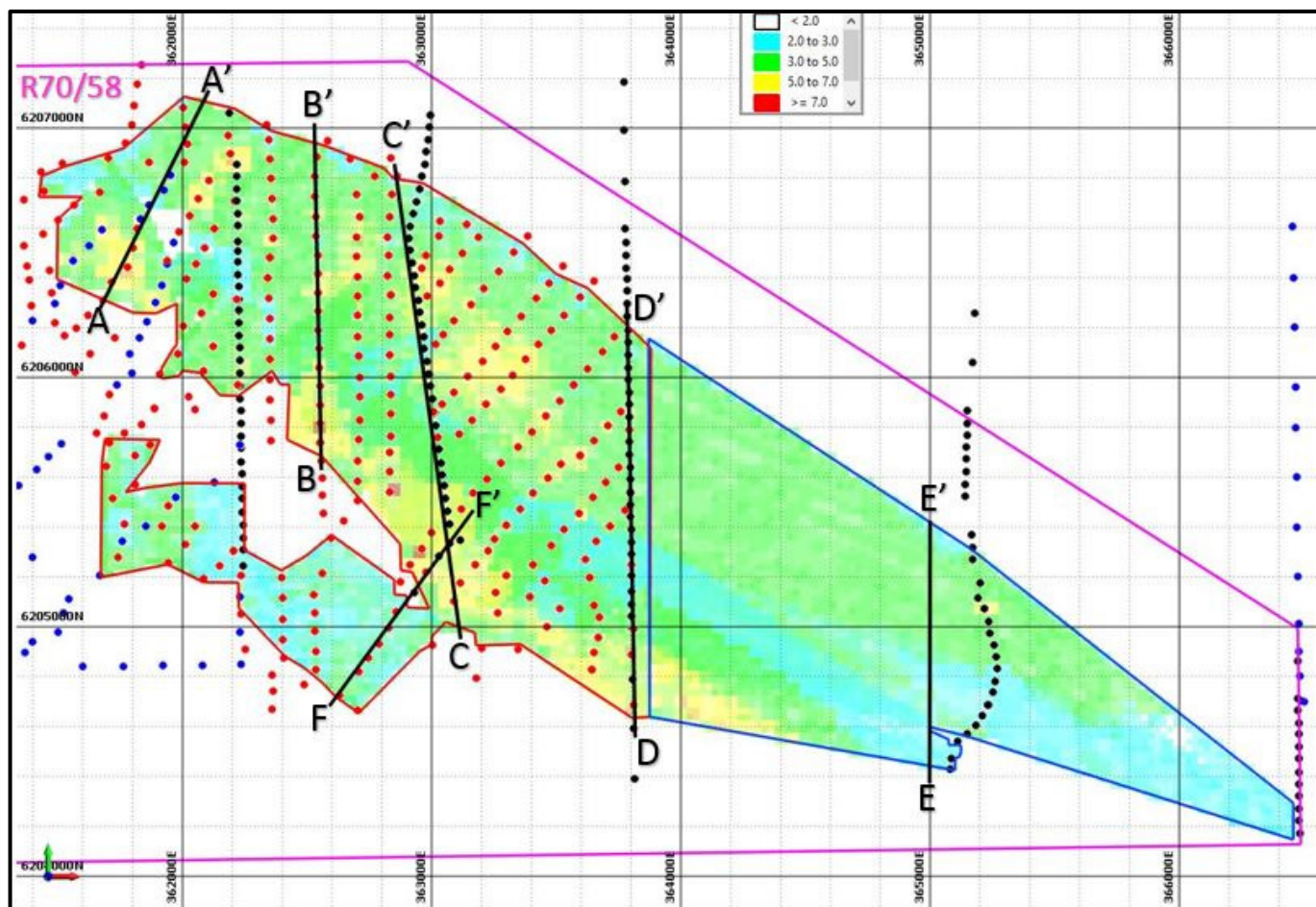
HM and slimes grades were used to form wireframed hard upper and lower boundaries to the mineralisation. The grade boundaries were based on a minimum 2% HM content and a maximum slimes limit of 35% for individual samples and 20% for intersections.

No upper cut was used for the HM grades, as virtually no outlying high values were present. The 2% lower cut-off was selected as this grade allowed grade continuity to be established between drill-holes. Grade interpolation was within 50m EW x 50m NS x 1m vertical blocks.

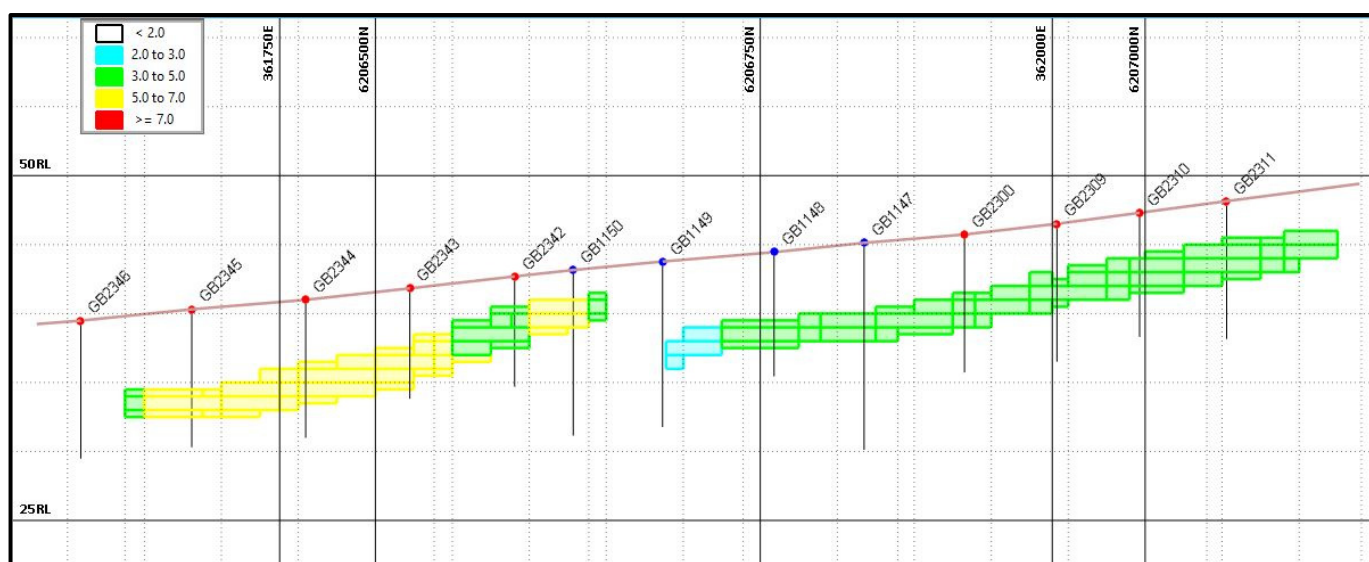
The wireframed bodies of mineralisation were restricted to areas that contained drill-holes with significant ratios of contained mineralisation to depth of overburden. The ratio used was "*sum of 1m HM grades within intersection to depth of base of mineralisation*" (e.g., 4m @ 4% HM to a depth of 10m would give a ratio of 16:10 or 1.6:1).

The wireframed areas contained drill-holes returning ratios of 1 or greater. A minimum intersection length of 2m was used.

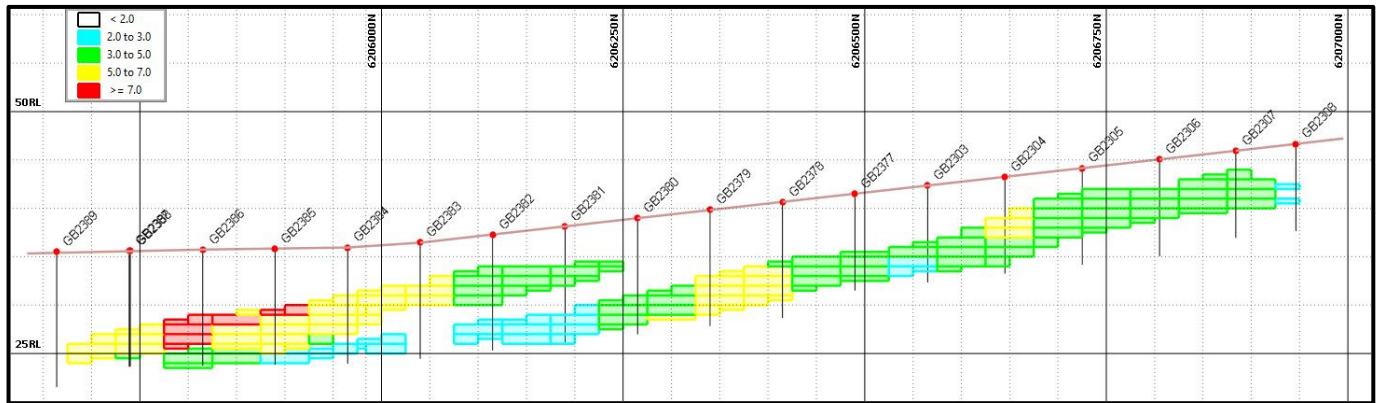
The resulting OBMs are shown in plan view in Figure 4 and in sectional view in Figures 5 to 10.



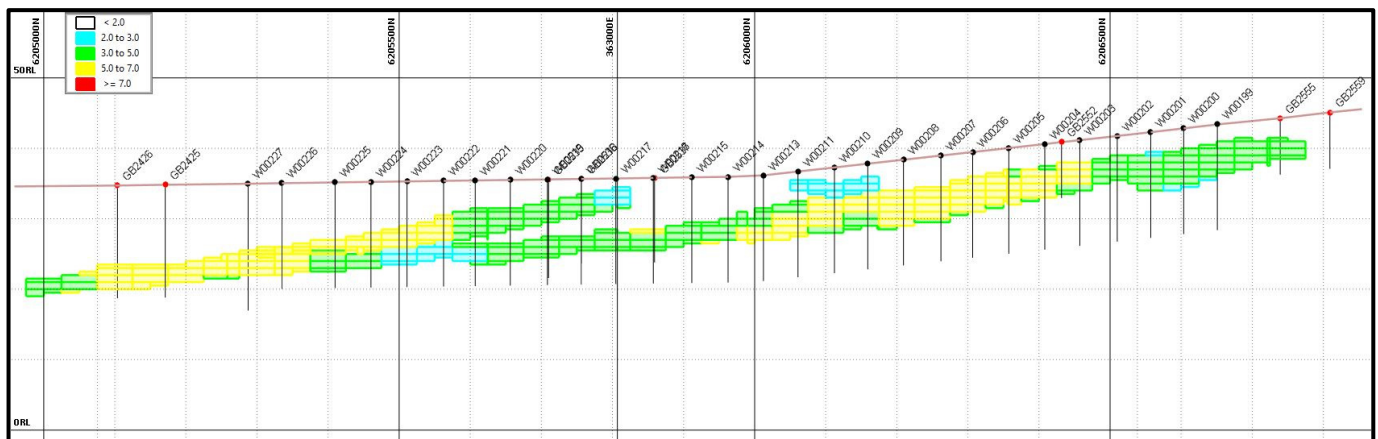
**Figure 4. OBMs of Jack Track Deposit Indicated Resource (infill drilled area) and Inferred Resource - coloured by HM grade. Drill holes: 2007 blue, 2015 black, 2022 red. Cross-section lines shown.**



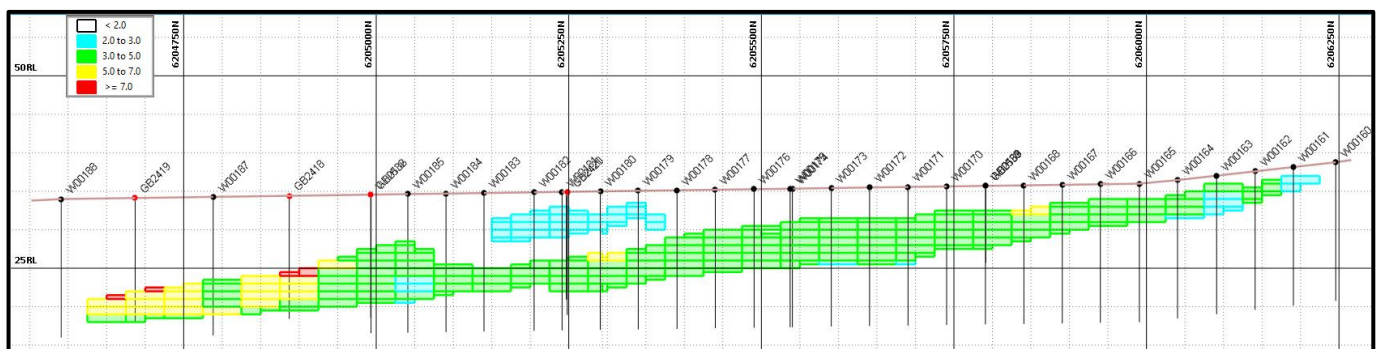
**Figure 5. Cross-section A-A' through Jack Track Deposit  
View to WNW - Vertical Exaggeration (VE) 10:1**



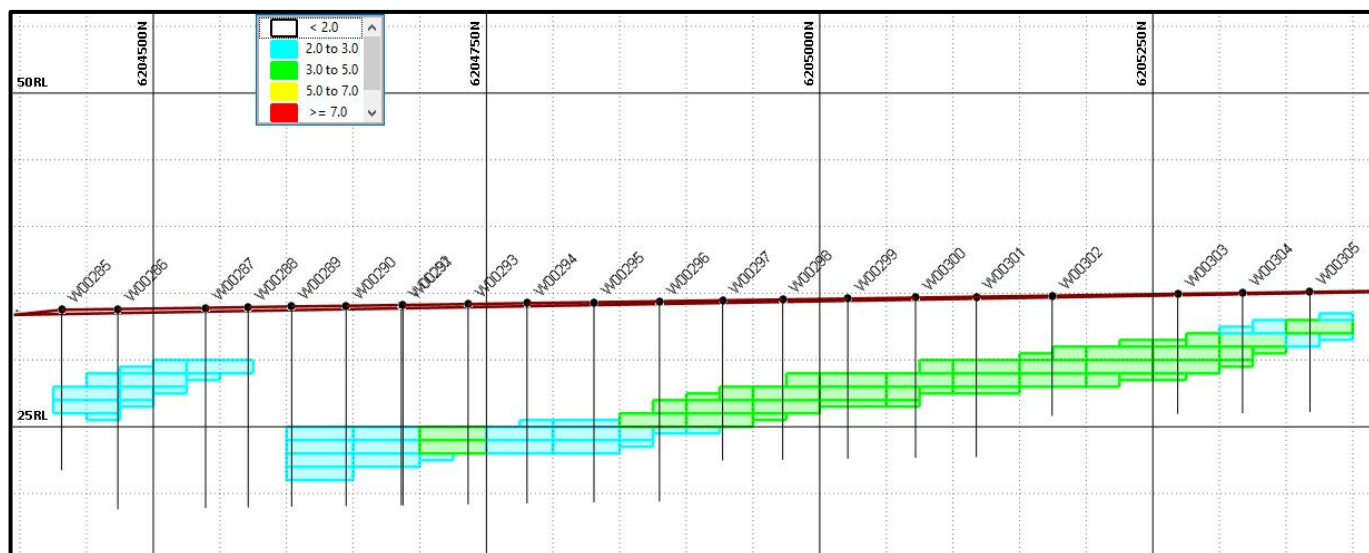
**Figure 6. Cross-section B-B' through Jack Track Deposit  
View to west - VE 10:1**



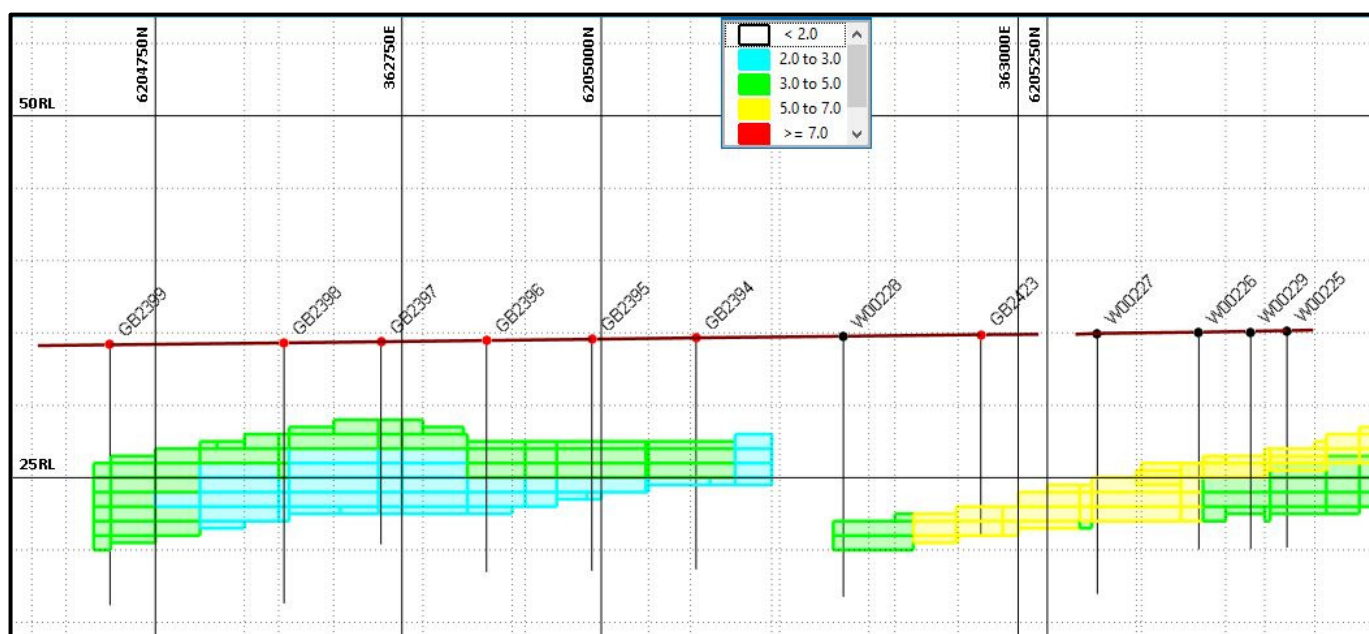
**Figure 7. Cross-section C-C' through Jack Track Deposit  
View to west - VE 10:1**



**Figure 8. Cross-section D-D' through Jack Track Deposit  
View to west - VE 10:1**



**Figure 9. Cross-section E-E' through Jack Track Deposit**  
View to west - VE 10:1



**Figure 10. Cross-section F-F' through Jack Track Deposit**  
View to northwest - VE 10:1

### Specific Gravities

The SG was calculated for each ore block based on its interpolated HM content according to the standard formula  $SG = 1.686 + (0.0108 \times HM\%)$ .

## Resource Classifications

The estimated resource within infill-drilled portion of the Jack Track and Jack Track Southwest Deposits are classified as Indicated, as the drilling has shown both geological and mineralisation continuity throughout the area and the drilling density has been such to enable the verification of grade continuity.

The estimated resource within the remaining portion of the Jack Track Deposit is classified as Inferred, as, although the drilling has shown both geological and mineralisation continuity throughout the area, the drilling density has not been such to enable the verification of grade continuity.

The drill-hole locations are shown on Figure 4. Those within the resource outlines are listed in Appendix 2 and HM intersections used for resource estimation are listed in Appendix 3.

## Resources

The estimated resources for the Jack Track Deposit are set out in Table 3.

**Table 3 Jack Track Deposit Mineral Resources - above 2% HM**

Category	Mineralisation Mt	HM %	Slimes %	Oversize %	Contained HM Mt
Indicated	22	4.5	7.4	7	0.98
Inferred	12	3.8	6	3	0.46
<b>Totals</b>	<b>34</b>	<b>4.2</b>	<b>7</b>	<b>6</b>	<b>1.4</b>

Note: Figures have been appropriately rounded

The estimated resources for the Jack Track Southwest Deposit are set out in Table 4.

**Table 4 Jack Track Southwest Deposit Mineral Resources - above 2% HM**

Category	Mineralisation Mt	HM %	Slimes %	Oversize %	Contained HM Mt
Indicated	4	3.0	7.4	5.7	0.12
Inferred	20	4.0	7	4	0.77
<b>Totals</b>	<b>24</b>	<b>3.8</b>	<b>7.1</b>	<b>4.3</b>	<b>0.9</b>

Note: Figures have been appropriately rounded

## *Previous Resource Estimates*

The Jack Track Deposit was estimated by Iluka and reported by Astro in 2016 as an Inferred Mineral Resource of 18.8 Mt @ 4.7% HM containing 890 thousand tonnes of HM at a 3.0% HM lower cut-off grade (ARO ASX Announcement 26<sup>th</sup> April 2016).

Astro reported a revised Inferred Resource for the deposit of 28Mt @ 4.1% HM containing 1.15Mt of HM (ARO ASX Announcement 8<sup>th</sup> November 2021). The larger tonnage was the result of the use of a lower block-cut-off grade of 2% HM and the extension of the resource about 800m to the west by the inclusion of two lines of holes drilled by Metal Sands in 2007.

CRM selected the lower block-cut-off grade of 2% due to the following:

1. this grade has been used for the estimation of the Governor Broome Resources to the west within R70/53 and consistency will be necessary for planned study of the economics of the entire Governor Broome Project; and
2. TZ Minerals International Pty Ltd's ("TZMI's") study in 2019 demonstrated the possibility of economic viability of mining 22.9Mt from the North Deposit and 7.9Mt from the South Deposit in R70/53. The study was based upon the resources that had been estimated using a 2% lower block-cut-off grade (ARO ASX Announcement 16<sup>th</sup> October 2016). As the mineral assemblage of the Jack Track Deposit is more valuable than that of the North and South Deposits, it is reasonable to conclude that the 2% cut-off grade is also potentially economic within R70/58; and
3. a 2% cut-off grade allows grade continuity to be established between drill-holes.

## *Overburden*

The overburden has an average depth of 5.1m over the area of the Jack Track Indicated Resource, which has an average thickness of 4.4m, for an overburden to mineralisation ratio of 1.15 :1. For the area of the Jack Track Inferred Resource the average depth to the mineralisation is 4.7m and its average thickness is 4.3m for a ratio of 1.1 : 1.

## **Governor Broome West Deposit Resource Revision**

When reporting the resource for the Governor Broome West Deposit in 2021 (ARO ASX Announcement 24<sup>th</sup> May 2021), the Competent Person chose to report the HM grade on the basis of an Adjusted HM% rather than as the total HM%, as trash minerals had been observed within the HMCs.

Astro has now received an AML report on the mineral assemblages of seven composite HMC samples from deposit. The reported assemblages are shown in Table 5.

**Table 5 West Deposit HMC Composite Assemblages**

Mineral	WA	WB	WC	WD	WE	WF	WG
	%(mass)	%(mass)	%(mass)	%(mass)	%(mass)	%(mass)	%(mass)
Primary ilmenite	61.1	54.6	55.9	65.1	55.7	66.2	45.9
Secondary ilmenite	6.0	4.4	2.9	6.0	6.4	7.6	3.2
Zircon (Tot)	5.7	3.9	3.1	5.6	5.8	7.8	4.4
Rutile	2.1	1.3	1.2	2.4	2.2	3.1	1.6
Monazite (Tot)	0.4	0.1	0.2	0.5	0.3	0.5	0.3
Garnet	21.7	30.1	24.7	15.2	23.4	13.7	21.1
Other	3.1	5.5	12.0	5.2	6.2	1.0	23.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The distribution of the minerals within the composite samples is fairly consistent, with the exception of those within the most southern sample. The percentages of the primary ilmenite, secondary ilmenite and zircon are similar to those obtained for these minerals within the product streams from the bulk testwork of the deposit (ARO ASX Announcement 16<sup>th</sup> June 2021).

Thus the Competent Person no longer considers it necessary to report the HM grade on the basis of an Adjusted HM%, rather than as (total) HM%.

#### *Resource Statement*

The Governor Broome West Deposit contains an Indicated Resource of 8.0Mt @ 5.0% HM, 13% Slimes, and 7.5% Oversize at a 2% HM lower block-cut-off grade.

#### **Mining Method**

It has been assumed that, for potential mining of the deposits, topsoil and overburden would be removed by scrapers and the mineralisation would be mined by bulldozer feeding an in-pit slurry unit. The slurry would be pumped to a wet concentrator to produce an HM concentrate. The waste would be returned to the mine void and covered with stored topsoil.

The deposits are within farmland and blue-gum plantations and suitable agreement compensation would need to be addressed with the owners and occupiers before mining was carried out.

## Proposed Work Program

### *Jack Track Mineral Assemblage*

Composite samples of the heavy mineral concentrate (“HMC”) from the recent drilling are to be processed by Allied Mineral Laboratories in Perth (“AML”) to determine the HM assemblage of the Jack Track Deposit.

### *Jack Track Bulk Testwork*

A bulk sample was collected during the recent in-fill drill program across the central portion of the Jack Track Deposit by combining approximately 8kg samples from each metre drilled within the mineralisation.

Those samples that are within the Indicated Resource are to be combined into a bulk sample that is to be treated by AML, to enable the preliminary development of a process flowsheet and to evaluate the grades and recoveries of the target HM products. This testwork is expected to commence shortly.

### *Governor Broome Project Scoping Study*

The upgrade of the deposits to Indicated Resource status and the scheduled testwork will enable a Scoping Study to be carried out into the mining of both the Governor Broome deposits within R70/53 (total Indicated Resources of 52Mt @ 4.7% HM) and of the Jack Track deposits (Indicated Resources of 26Mt @ 4.0% HM).

### *Jack Track Tenement Drilling*

The Company intends to complete the in-fill drilling of the remaining areas (Jack Track Northwest, Jack Track West and the remaining parts of Jack Track Southwest and Jack Track deposits) in February 2023, the next available opportunity to complete the program.

## Authorisation

**This announcement has been authorised for release by the board of ARO.**

## More Information

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The information in this report as it relates to Mineral Resources and Exploration Results for the Governor Broome Project is based on information compiled by John Doepel, a Director of Continental Resource Management Pty Ltd (CRM), who is a member of the Australasian Institute of Mining and Metallurgy. Mr Doepel has sufficient experience in mineral resource estimation relevant to the style of mineralisation and type of deposit under consideration 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 Doepel consents to the inclusion in this announcement of the information in the form and context in which it appears.

# APPENDIX 1 - JORC Code, 2012 Edition – Table 1

## Section 1 Sampling Techniques and Data

Criteria	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>Air-core drilling was used to obtain 1m samples from target horizons;</li> <li>Approximately 1 to 1.5 kg sub-samples were split by scoop from 1m samples.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>Vertical NQ Air-core.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Good recovery and retention of all size fractions;</li> <li>Holes cleaned at completion of each two-metre rod;</li> <li>Cyclone cleaned after each hole</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>All intervals geologically logged by Competent Person during drilling.</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>Sample preparation via drying and manual pulverisation before removal of +3.3mm material; 100g sub- samples riffle split from remaining sample.</li> </ul>
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li>Analysis by Western Geolabs Pty Ltd by its standard HM analytical procedures for HM%, Slimes % (-53µ), and Oversize % (+710µ); Repeat laboratory sub-sample splits analysed at 1:12 ratio.</li> <li>Western Geolabs Pty Ltd re-analysed 10% of samples from within the mineralised wireframes at -45µ, +710µ.</li> </ul>
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>Sampling and logging carried out by or under supervision of Competent Person.</li> <li>Assay entry by digital capture of laboratory files, with later verification of significant intervals against geological logging.</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>Holes located by hand-held GPS for Astro holes.</li> <li>Grid MGA_GDA94, Zone 50;</li> <li>Elevation data interpolated from elevation data on Google Earth.</li> </ul>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>1m samples collected and analysed throughout mineralized horizons.</li> <li>Holes drilled on approximate 80m spacing along lines approximately 160m apart.</li> <li>Duplicate samples collected at 1:20 ratio.</li> <li>Twinned holes drilled at 1:20 ratio.</li> <li>No sample compositing applied.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>Vertical drilling through horizontal stratigraphy resulted in intersected thickness equivalent to true thickness.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>Samples transported from site to laboratory by drill company personnel.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>Review will be carried out by Competent Person.</li> </ul>

## Section 2 Reporting of Exploration Results

Criteria	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>The Jack Track resources are within Retention Licence R70/58.</li> <li>The West Deposit resource is within Retention Licence R70/53.</li> <li>Both R70/53 and R70/58 are held by Governor Broome Sands Pty Ltd, a wholly owned subsidiary of Astro Resources NL.</li> <li>R70/53 has an expiry date of 3/07/2026 and R70/58 has an expiry date of 24/07/2024.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Metals Sands Australia Ltd carried out an air-core drilling campaign over the ground in 2007.</li> <li>Iluka carried out an air-core drilling campaign over the ground in 2015. These explorations are summarised in this announcement.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>The deposits are located in the Scott Coastal Plain, within the Perth Basin. They consists of beach deposited HM strands. The host beach sand facies (Warren Sands) is overlain by sand and soil at surface. The poorly sorted and arkosic (fluvial) Beenup Beds forms the basement.</li> </ul>
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>Appendix 2 lists Metal Sands, Astro, and Iluka air-core drill-holes drilled into the Jack Track Deposit.</li> <li>Appendix 3 lists HM intercepts for each hole within the resource areas.</li> </ul>
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>No data aggregation was carried out for the resource estimation.</li> <li>Only intersections averaging &gt;2% HM and &lt;20% Slimes were incorporated into wireframed mineralisation.</li> <li>No metal equivalents employed.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>Vertical drilling through virtually horizontal stratigraphy resulted in intersected thickness equivalent to true thickness.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>See Figures.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>Report gives balanced view of the deposits.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>Iluka carried out Mineralogical testwork on 12 composite samples of HM sinks from its 2015 drilling to determine the mineral assemblage and indicative mineral quality. These samples underwent a magnetic separation using a permanent magnetic roll separator set up. The magnetic and non-magnetic fractions (that come out of the magnetic separator) then had an XRF analysis completed. A small portion (~10grams) was sent for Specific Gravity (SG) separation using Thallium Malonate Solution (TMF). This separation technique was used to determine grain size and indicative chemistry for Zircon and Rutile.</li> <li>Apart from minor sulphide detected, no deleterious or potentially deleterious or contaminating substances were identified by Iluka within the Jack Track Deposit.</li> </ul>

### Section 3 Estimation and Reporting of Mineral Resources

Criteria	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Assay and drill-hole data entered by Competent Person.</li> <li>Assay data copied digitally from Astro database and from files obtained from Iluka.</li> <li>Micromine drill-hole verification performed.</li> <li>Anomalous intersections checked.</li> <li>Drill-hole collar elevations checked, and if necessary, adjusted.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Competent person drilled the Jack Track Deposit in 2022 and the West Deposit in 2020.</li> <li>Competent person visited the project during Metal Sands drilling in 2007.</li> </ul>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>High degree of confidence in geological interpretation as stratigraphy is both visually and analytically distinct and continuous.</li> <li>Mineralisation &gt;2% HM and &lt;20% Slimes wireframed. Area limited by ratio &gt;1 for "<i>mineralisation thickness times HM% divided by depth of base of mineralisation</i>".</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>The Jack Track Deposit has an along strike length of 5.5km and an across-strike width of 1.25km.</li> <li>The Indicated Resource within the Jack Track Deposit has an average overburden thickness of 5.2m and an average mineralisation thickness of 4.4m; for an overburden to mineralisation ratio of 1.2:1.</li> <li>The Inferred Resource within the Jack Track Deposit has an average overburden thickness of 4.7m and an average mineralisation thickness of 4.3m; for an overburden to mineralisation ratio of 1.1:1.</li> </ul>
<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li>Estimation of HM, Slimes, and Oversize ore block grades by IS2 within &gt;2% adjusted HM and &lt;20% Slimes wireframes using Micromine software;</li> <li>Block size 50m E-W x 50m N-S x 1m vertical.</li> <li>For area drilled in 2022 average hole spacing along lines 80m and average line spacing 160m.</li> <li>For area drilled in 2015, average hole spacing along lines 50m and line spacing but up to 1700m along strike.</li> <li>Grade boundaries form hard upper and lower boundaries;</li> <li>No assumptions made re correlation between variables;</li> <li>No upper cuts, as virtually no outlying values;</li> <li>No estimation of deleterious elements, as no data available;</li> <li>No assumptions made re recovery of by-products;</li> <li>OBM grades validated by comparison with assay values.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li>Tonnages estimated on dry basis.</li> </ul>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>Estimate initially reported above a range of grades. Final report grade of above 2% HM selected on basis of grade continuity of mineralisation.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>Topsoil and overburden to be removed by scrapers and mineralisation to be mined by bulldozer feeding in-pit slurry unit.</li> </ul>
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li>Slurry pumped to wet concentrator to produce HM concentrate.</li> </ul>
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li>Waste to be returned to mine void and covered with stored topsoil;</li> <li>There is potential for the creation of acidic soils that would need to be managed.</li> </ul>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li>SG calculated for each ore block on the basis of its interpolated HM content according to the standard formula <math>SG = 1.686 + (0.0108 \times HM\%)</math>;</li> <li>Average SG = 1.73;</li> </ul>

<b>Classification</b>	<ul style="list-style-type: none"> <li>• The resources within the area drilled in 2022 were classified as Indicated, as the drilling has shown both geological and mineralisation continuity throughout the area and the drilling density has been such to enable the verification of grade continuity.</li> <li>• The resources within the area only drilled in 2015 were classified as Inferred as, although the drilling has shown both geological and mineralisation continuity throughout the area, the drilling density has not been such to enable the verification of grade continuity</li> <li>• The resource estimate appropriately reflects the Competent Person's impression of the deposit.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>• No audit or review has been carried out on this resource estimate.</li> </ul>
<b>Discussion of relative accuracy / confidence</b>	<ul style="list-style-type: none"> <li>• The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC Code.</li> <li>• The global resources reported are the total of the local estimates reported for each of the areas.</li> </ul>

## APPENDIX 2 – DRILL-HOLE DETAILS

The table below details the air-core drill-holes used for the resource estimates. All holes were drilled vertically. Holes numbered between GB1147 and GB1168 were drilled by Metal Sands in 2007, those numbered between W00161 and W00304 were drilled by Iluka in 2015, and those numbered between GB2295 and GB2598 were drilled by Astro in 2022.

Hole ID	E MGA Z50 (GDA94)	N MGA Z50 (GDA94)	RL (m)	Depth (m)
GB1147	361952	6206811	35.0	15
GB1148	361926	6206751	34.1	9
GB1149	361865	6206691	33.3	12
GB1150	361830	6206636	32.5	12
GB1151	361676	6206592	32.1	12
GB1152	361626	6206527	31.7	6
GB1153	361561	6206466	31.3	12
GB1166	361890	6206299	31.4	12
GB1167	361919	6206371	31.6	12
GB1168	361938	6206457	31.8	12
W00161	363787	6206191	33.8	18
W00162	363788	6206141	33.6	18
W00163	363789	6206091	33.9	18
W00164	363789	6206040	33.6	18
W00165	363790	6205991	33.3	18
W00166	363791	6205940	32.9	18
W00167	363792	6205891	32.5	18
W00168	363793	6205841	32.2	18
W00169	363794	6205791	32.2	18
W00170	363794	6205741	31.6	18
W00171	363795	6205691	32.2	18
W00172	363796	6205640	31.7	18
W00173	363796	6205591	31.6	18
W00174	363796	6205540	31.2	18
W00176	363798	6205491	31.0	18
W00177	363798	6205440	30.4	18
W00178	363800	6205390	31.1	18
W00179	363800	6205340	30.9	18
W00180	363801	6205291	30.7	18
W00181	363802	6205241	30.9	18
W00182	363802	6205205	30.6	18
W00183	363803	6205140	30.0	18
W00184	363803	6205091	29.8	18
W00185	363804	6205041	29.6	18
W00186	363805	6204993	29.4	18
W00187	363807	6204788	29.7	18
W00198	362939	6206705	38.5	15
W00199	362926	6206657	38.2	15
W00200	362916	6206607	37.8	15
W00201	362909	6206559	37.6	15
W00202	362914	6206511	37.4	15
W00203	362923	6206459	37.1	15
W00204	362931	6206410	36.9	15

W00205	362936	6206359	36.6	15
W00206	362946	6206309	36.4	15
W00207	362952	6206264	36.3	15
W00208	362960	6206211	36.2	15
W00209	362968	6206161	36.1	15
W00210	362971	6206114	36.0	15
W00211	362981	6206063	35.9	15
W00212	362989	6206015	35.5	15
W00213	362987	6206014	35.5	15
W00214	362995	6205965	35.4	15
W00215	363003	6205914	34.3	15
W00216	363011	6205860	34.1	15
W00217	363018	6205807	33.2	15
W00218	363024	6205758	33.0	15
W00219	363030	6205711	33.4	15
W00220	363037	6205659	33.8	15
W00221	363044	6205609	33.6	15
W00222	363050	6205565	33.4	15
W00223	363056	6205513	32.6	15
W00224	363063	6205462	32.5	15
W00225	363071	6205412	32.2	15
W00226	363072	6205336	32.0	15
W00227	363027	6205282	31.6	18
W00229	363117	6205348	32.0	15
W00230	362189	6207061	38.6	15
W00231	362220	6206854	36.7	15
W00232	362219	6206807	35.5	15
W00233	362219	6206756	36.0	15
W00234	362220	6206707	35.5	15
W00235	362221	6206656	35.0	15
W00236	362222	6206608	34.6	15
W00237	362224	6206545	33.7	15
W00238	362224	6206508	33.2	15
W00239	362224	6206463	34.0	15
W00240	362224	6206412	32.5	15
W00241	362225	6206363	32.3	15
W00242	362226	6206313	32.5	15
W00243	362227	6206269	32.2	15
W00244	362225	6206268	32.1	15
W00245	362228	6206220	32.0	15
W00246	362228	6206170	32.0	15
W00247	362229	6206120	31.5	15
W00248	362230	6206068	31.0	15
W00249	362231	6206018	30.9	15
W00250	362232	6205968	30.8	15
W00270	366484	6204171	36.0	15
W00271	366481	6204221	37.0	15
W00272	366478	6204270	39.0	12
W00273	366480	6204320	40.0	12
W00274	366480	6204370	41.0	12
W00300	365219	6205072	34.0	12
W00301	365194	6205118	34.0	12

W00302	365202	6205174	34.0	9
W00303	365170	6205269	34.0	9
W00304	365169	6205317	34.0	9
GB2295	362223	6205968	36.0	12.0
GB2296	362216	6206313	39.5	12.0
GB2297	362209	6206707	44.0	8.2
GB2298	362193	6206896	46.1	8.0
GB2299	362185	6206969	46.9	7.0
GB2300	362007	6206865	45.7	10.0
GB2301	361867	6206862	45.7	10.0
GB2303	362534	6206565	42.4	10.0
GB2304	362534	6206645	43.3	10.0
GB2305	362531	6206725	44.2	10.0
GB2306	362530	6206805	45.1	10.0
GB2307	362539	6206884	45.9	9.0
GB2309	362019	6206934	46.5	10.0
GB2310	362011	6207005	47.3	9.0
GB2311	362002	6207080	48.2	10.0
GB2312	361704	6206882	45.9	10.0
GB2318	362365	6206559	42.3	10.0
GB2319	362362	6206637	43.2	10.0
GB2320	362358	6206717	44.1	10.0
GB2321	362356	6206797	45.0	10.0
GB2322	362353	6206875	45.8	10.0
GB2323	362346	6206953	46.7	8.0
GB2326	361446	6206746	44.4	10.0
GB2341	361668	6206743	44.4	8.0
GB2342	361817	6206595	42.7	8.0
GB2343	361801	6206518	41.8	8.0
GB2344	361780	6206444	41.0	10.0
GB2345	361717	6206383	40.3	10.0
GB2346	361683	6206310	39.5	10.0
GB2350	362107	6206789	44.9	10.0
GB2351	362063	6206719	44.1	10.0
GB2352	362029	6206647	43.3	10.0
GB2354	362091	6206519	41.8	10.0
GB2366	362350	6206480	41.4	10.0
GB2367	362350	6206481	41.4	12.0
GB2368	362344	6206398	40.5	12.0
GB2369	362348	6206317	39.6	10.5
GB2370	362350	6206235	38.6	9.6
GB2371	362350	6206154	37.7	8.5
GB2372	362352	6206072	36.8	12.0
GB2377	362544	6206490	41.5	10.0
GB2378	362544	6206415	40.7	12.0
GB2379	362545	6206340	39.8	12.0
GB2380	362546	6206265	39.0	12.0
GB2381	362546	6206190	38.1	12.0
GB2382	362549	6206115	37.3	12.0
GB2383	362550	6206040	36.5	12.0
GB2384	362551	6205965	36.0	12.0
GB2385	362553	6205890	35.8	12.0

GB2386	362553	6205815	35.7	12.0
GB2387	362555	6205739	35.6	12.0
GB2388	362555	6205740	35.6	12.0
GB2409	363300	6205204	34.9	14.0
GB2410	363255	6205137	34.8	16.0
GB2411	363407	6205251	34.9	14.0
GB2412	363266	6205054	34.6	18.0
GB2417	363650	6204899	34.4	16.0
GB2418	363803	6204887	34.4	16.0
GB2419	363810	6204687	34.1	16.0
GB2420	363803	6205248	34.9	16.0
GB2421	363803	6205247	34.9	14.0
GB2422	363227	6205303	35.0	14.0
GB2423	362979	6205217	34.9	14.0
GB2424	363177	6205247	34.9	14.0
GB2425	363117	6205175	34.8	16.0
GB2426	363091	6205103	34.7	16.0
GB2427	363392	6205119	34.7	16.0
GB2428	363618	6205271	35.0	14.0
GB2429	363635	6205198	34.9	16.0
GB2430	363456	6205184	34.8	14.0
GB2431	363650	6205086	34.7	16.0
GB2432	363513	6205072	34.7	16.0
GB2433	363674	6205037	34.6	14.0
GB2434	363644	6204828	34.3	15.7
GB2435	363645	6204828	34.3	15.7
GB2436	362128	6206596	42.7	10.0
GB2437	362057	6206456	41.1	14.0
GB2439	362018	6206393	40.4	10.0
GB2440	362122	6206336	39.8	14.0
GB2441	362076	6206257	38.9	12.0
GB2442	362002	6206207	38.3	12.0
GB2443	362122	6206123	37.4	12.0
GB2444	362087	6206024	36.3	14.0
GB2445	361982	6206095	37.1	12.0
GB2447	361910	6206012	36.1	10.0
GB2448	362697	6206561	42.3	10.0
GB2449	362698	6206485	41.5	10.0
GB2450	362702	6206405	40.6	10.0
GB2451	362703	6206327	39.7	12.0
GB2452	362705	6206250	38.8	12.0
GB2453	362705	6206164	37.8	10.0
GB2454	362709	6206084	36.9	10.0
GB2455	362709	6206085	37.0	10.0
GB2456	362710	6206000	36.0	12.0
GB2457	362711	6205925	35.9	12.0
GB2458	362711.9	6205828	35.8	12.0
GB2459	362706	6205750	35.6	12.0
GB2460	362701	6205667	35.5	12.0
GB2461	362701	6205584	35.4	12.0
GB2465	362825	6206562	42.3	12.0
GB2466	362826	6206490	41.5	10.0

GB2467	362825	6206406	40.6	10.0
GB2468	362835	6206331	39.7	10.0
GB2469	362835	6206332	39.7	10.0
GB2470	362833	6206242	38.7	12.0
GB2471	362832	6206170	37.9	12.0
GB2472	362834	6206091	37.0	10.0
GB2473	362836	6206006	36.1	12.0
GB2474	362836	6205930	35.9	12.0
GB2475	362838	6205854	35.8	10.9
GB2476	362837	6205762	35.7	12.0
GB2504	362675	6206875	45.8	8.0
GB2506	363031	6206565	42.4	8.0
GB2507	363186	6206562	42.3	8.0
GB2510	363473	6206377	40.2	8.0
GB2511	363421	6206318	39.6	8.0
GB2512	363361	6206246	38.8	8.0
GB2513	363305	6206186	38.1	8.0
GB2514	363258	6206126	37.4	10.0
GB2515	363205	6206065	36.7	10.0
GB2516	363147	6206003	36.0	10.0
GB2517	363091	6205941	35.9	10.0
GB2518	363043	6205892	35.8	10.0
GB2520	363596	6206323	39.6	8
GB2521	363531	6206249	38.8	8
GB2522	363480	6206189	38.1	8
GB2523	363429	6206132	37.5	8
GB2524	363378	6206072	36.8	8
GB2525	363325	6206010	36.1	10
GB2526	363280	6205955	35.9	10
GB2527	363220	6205894	35.8	10
GB2528	363163	6205830	35.8	12
GB2529	363109	6205772	35.7	12
GB2530	363792	6205791	35.7	10
GB2531	363791.5	6205792	35.7	10
GB2532	363809	6204993	34.6	16.0
GB2533	363669	6204958	34.5	16.0
GB2534	363461	6204999	34.6	16.0
GB2535	363027	6205712	35.6	14.0
GB2536	363023	6205759	35.7	12.0
GB2537	363006	6205861	35.8	12.0
GB2538	362833	6205700	35.6	14.0
GB2539	362833	6205622	35.5	14.0
GB2540	362833	6205542	35.3	14.0
GB2541	363329	6206503	41.7	8.0
GB2542	363269	6206427	40.8	8.0
GB2543	363208	6206356	40.0	8.0
GB2544	363156	6206293	39.3	10.0
GB2545	363091	6206226	38.5	10.0
GB2546	363045	6206171	37.9	10.0
GB2547	363018	6206132	37.5	10.0
GB2548	363124	6206496	41.6	8.0
GB2549	363074	6206432	40.9	8.0

GB2550	363032	6206379	40.3	8.0
GB2551	362981	6206327	39.7	10.0
GB2552	362961	6206438	40.9	8.0
GB2553	362976	6206491	41.5	8.0
GB2554	362975.3	6206490	41.5	8.0
GB2555	362840	6206735	44.3	8.0
GB2556	362700	6206733	44.2	8.0
GB2557	362830	6206643	43.2	8.0
GB2558	362710	6206643	43.2	8.0
GB2560	362773	6206806	45.1	8.0
GB2561	363032	6206626	43.0	8.0
GB2562	363139	6206615	42.9	8.0
GB2563	363734	6206162	37.8	8.0
GB2564	363685	6206104	37.2	8.0
GB2565	363626	6206033	36.4	8.0
GB2566	363570	6205968	36.0	10.0
GB2567	363570.7	6205969	36.0	10.0
GB2568	363515	6205906	35.9	10.0
GB2569	363458	6205845	35.8	10.0
GB2570	363403	6205782	35.7	10.0
GB2571	363345	6205720	35.6	12.0
GB2572	363280	6205658	35.5	12.0
GB2573	363223	6205594	35.4	12.0
GB2574	363165	6205536	35.3	12.0
GB2575	363118	6205474	35.2	12.0
GB2576	363752	6205640	35.5	10.0
GB2577	363699	6205578	35.4	12.0
GB2578	363647	6205520	35.3	14.0
GB2579	363590	6205456	35.2	14.0
GB2580	363533	6205390	35.1	14.0
GB2581	363479	6205328	35.0	14.0
GB2582	363760	6205863	35.8	8.0
GB2583	363706	6205806	35.7	10.0
GB2584	363652	6205749	35.6	10.0
GB2585	363595	6205686	35.6	10.0
GB2586	363595.7	6205687	35.6	12.0
GB2587	363519	6205653	35.5	12.0
GB2588	363465	6205596	35.4	12.0
GB2589	363408	6205536	35.3	14.0
GB2590	363355	6205471	35.2	14.0
GB2591	363298	6205409	35.2	14.0
GB2592	363253	6205353	35.1	14.0
GB2593	363775	6205467	35.2	12.0
GB2594	363716	6205404	35.1	14.0
GB2595	363661	6205342	35.1	14.0
GB2596	363001	6205376	35.1	14.0
GB2597	362961	6205315	35.0	14.0
GB2598	362914	6205249	34.9	14.0

## APPENDIX 3 – Drill-hole Intersections

All holes are vertical.

Hole ID	E MGA Z50 (GDA94)	N MGA Z50 (GDA94)	From (m)	Interval (m)	HM %
GB1147	361952	6206811	5	2	5.0
GB1148	361926	6206751	5	2	3.7
GB1149	361865	6206691	5	2	1.3
GB1150	361830	6206636	2	2	5.4
GB1151	361676	6206592	3	4	4.9
GB1152	361626	6206527	4	2	5.3
GB1153	361561	6206466	3	3	5.8
GB1166	361890	6206299	6	2	6.3
GB1167	361919	6206371	6	3	4.3
GB1168	361938	6206457	4	4	4.0
GB1169	361963	6206539	4	1	2.5
GB1172	361972	6205521	5	4	3.6
GB1173	361852	6205404	6	5	3.6
GB1174	361759	6205343	7	2	3.0
GB1175	361670	6205207	8	3	4.2
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W00162	363788	6206141	2	1	5.6
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W00164	363789	6206040	2	2	4.5
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W00177	363798	6205440	5	5	4.6
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W00187	363807	6204788	12	4	5.2
W00198	362939	6206705	3	3	2.9
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W00200	362916	6206607	3	4	4.1
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W00241	362225	6206363	5	3	2.1
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W00246	362228	6206170	8	3	3.2
W00247	362229	6206120	8	3	5.2
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W00272	366478	6204270	4	2	2.0
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W00304	365169	6205317	2	2	3.7
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GB2319	362362	6206637	6	2	3.9
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GB2322	362353	6206875	3	3	3.8
GB2323	362346	6206953	3	2	2.4
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GB2342	361817	6206595	2	3	4.6
GB2343	361801	6206518	4	3	5.4
GB2344	361780	6206444	5	3	7.0
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GB2379	362545	6206340	7	4	5.9
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GB2381	362546	6206190	9	3	2.3
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GB2420	363803	6205248	2	4	2.6
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GB2421	363803	6205247	9	3	4.9
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GB2466	362826	6206490	3	6	3.9
GB2467	362825	6206406	4	6	3.8
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GB2471	362832	6206170	4	7	4.6
GB2472	362834	6206091	6	4	3.8
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GB2544	363156	6206293	3	5	6.1
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GB2563	363734	6206162	2	2	5.2
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GB2589	363408	6205536	10	2	3.0
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GB2594	363716	6205404	8	4	5.1
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