

31st March 2021

# **Bulk Testwork Program Continues to Deliver Positive Results at Governor Broome Project**

## **Key Highlights**

- > Governor Broome Heavy Minerals Project 2.6 tonne bulk sample test-work program well advanced
- > Heavy mineral concentrate successfully produced in the wet concentrator using conventional mineral sands processing equipment
- > Processing utilised pilot scale four-stage gravity separation circuit employing full-size spiral concentrators
- > Further processing underway to investigate the metallurgical response through a typical dry plant flowsheet to allow an assessment of the potential mineral products
- > Dry processing testwork demonstrates that a primary ilmenite fraction could be isolated using conventional mineral separation equipment
- > Work continues to investigate potential zircon, altered ilmenite, and garnet products
- > Final results for metallurgical test work expected late April
- > Updated Scoping Study will carried out in 2021 incorporating the results from the metallurgical test-work

Astro Resources NL (ASX:ARO) ("ARO", "Astro" or "the Company") is pleased to provide the following update on the bulk sample metallurgical testwork currently underway on a 2.6t bulk sample from the West Deposit of its Governor Broome Heavy Mineral Project, located in the South West of Western Australia.

Astro's Chairman, Jacob Khouri commented "The results provided from the Governor Broome metallurgical testwork demonstrate we are on the strong road to economic viability of the Project. Particularly pleasing is the recovery of a clean ilmenite concentrate. Further process test-work on the recovery of the high-value products zircon and altered ilmenite is currently underway and we look forward to reporting the full results of the metallurgical testwork during April."

The current testwork program, designed to assess the metallurgical performance of material sourced from the Governor Broome deposit (Figure 1), is well underway and comprises three key stages:

- > Process development testwork on the bulk sample from the West Deposit
- > Sighter testwork on the second bulk sample taken from the East Deposit
- > Mineralogical characterisation of twenty separate Heavy Mineral (**HM**) concentrates obtained from the drilling of the West, East, and South Deposits

Significantly, the Company notes that the entire sand fraction (-2mm + 0.045mm), previously reported on 21 December 2020, was processed through a gravity upgrade circuit to isolate a concentrate stream containing valuable heavy minerals.

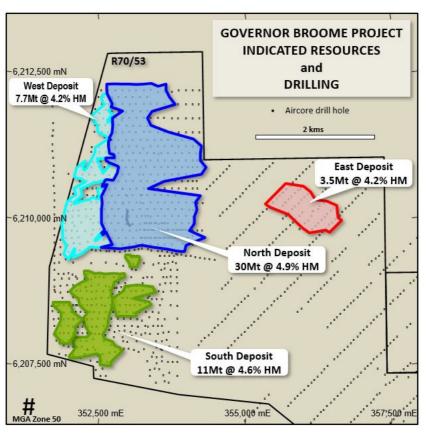


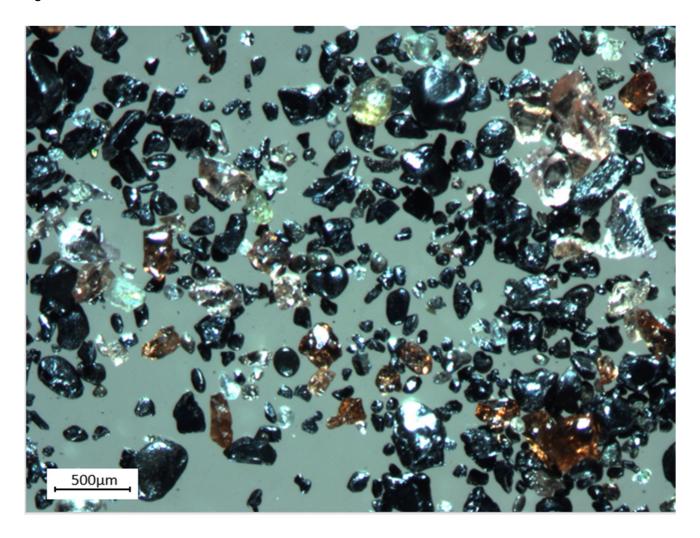
Figure 1. Governor Broome HM Deposits

The process development testwork on the bulk sample from the West Deposit commenced early in 2021 with the pilot scale processing of a 2.6t sample at Allied Mineral Laboratories (Perth) (**AML**) using equipment as a proxy for a full-scale plant. During the trial, the metallurgical performance of the material was assessed using full-scale gravity concentration spirals in a four-stage circuit.

Processing of the sand fraction (-2mm +0.045mm) generated during the first part of the trial successfully demonstrated that a heavy mineral concentrate containing valuable heavy minerals could be produced with minimal recovery losses. The low-density gangue minerals in the sand fraction (-2mm +0.045mm) were successfully rejected to tails producing a heavy mineral concentrate containing 98% heavy mineral.



A photomicrograph of the heavy mineral concentrate separated from the sand fraction is shown in Figure 2.



**Figure 2.** Photomicrograph of heavy mineral concentrate produced during the testwork program (Scale approximate)

The mass yield to the heavy mineral concentrate from the sand fraction was 4.3%.

The heavy mineral concentrate is currently undergoing further testing to evaluate the metallurgical response of the valuable heavy minerals, through a dry mineral separation circuit using conventional separation equipment. Final products produced will enable an assessment of their indicative quality.



Dry processing testwork completed to date has demonstrated that a primary ilmenite product containing 51% TiO<sub>2</sub> and low in impurities could be isolated using conventional mineral separation equipment. A photomicrograph of a sample of the ilmenite produced is shown in Figure 3.

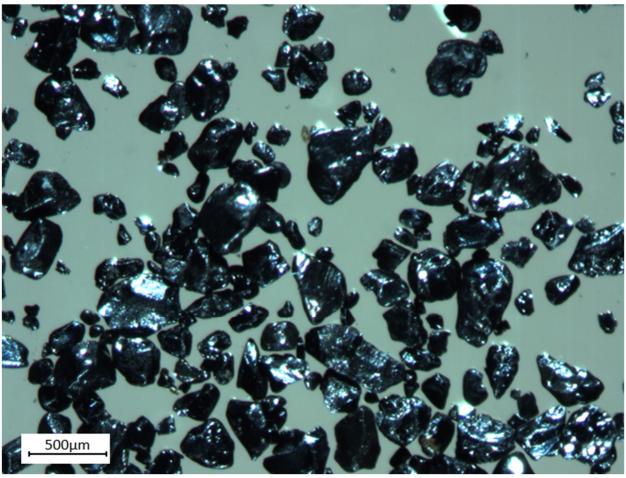


Figure 3. Photomicrograph of primary ilmenite produced during the testwork program (Scale approximate)

Testwork is ongoing with work underway to characterise additional potential zircon, altered ilmenite, and garnet products.

A sample of the slimes (<45um fines fraction) is being characterised by Outotec in Perth to evaluate settling performance, to assess the potential for water recovery, so as to be able to minimise overall project water requirements.

It is expected that final results of the 2.6t bulk sample trial will be available in April 2021.

The bulk sample was sourced from the full depth of the modelled HM mineralisation in all the air-core holes drilled by Astro into the West Deposit during early 2020 and as such, is representative of its HM mineralisation. The hole locations are detailed in Figure 4. Full details of the drilling program including hole locations and HM intersections and details of the West Deposit Indicated Resources were reported to the ASX on 24<sup>th</sup> April 2020. Details of the exploration program are provided in the Appendices of this announcement.



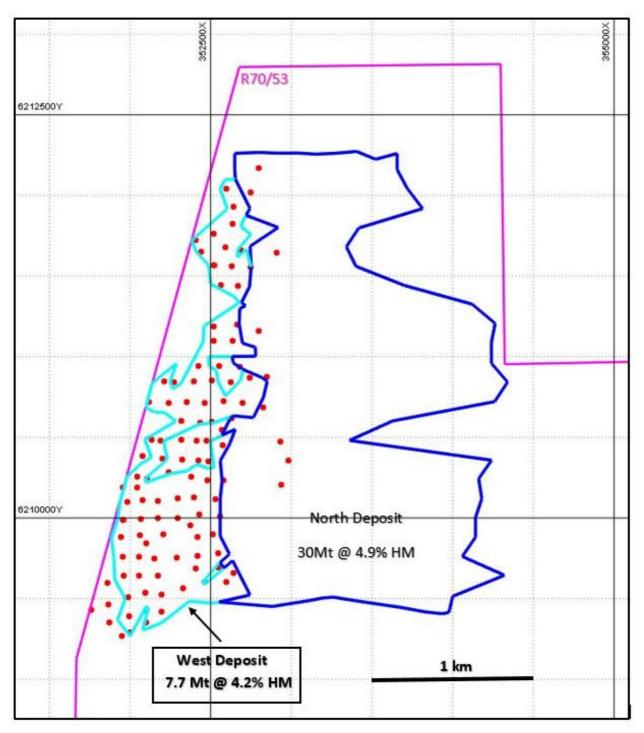


Figure 4. Bulk Sample Drill-holes (red)

The results of the testwork program will provide information relating to the mineral recoveries and product quality which will be used to complete an updated Scoping Study for Governor Broome later this year. The updated Scoping Study (from Astro's previous 2018 and 2019 Scoping Study assessments) is required due to the Project's Indicated Resources in the North Deposit increasing from 30Mt @ 4.9% HM (solely in the North Deposit) to a total of 52 Mt @ 4.6% HM. At this stage, the Company aims to commence the Scoping Study as soon as possible.

#### **BOARD APPROVAL**

This announcement has been approved by the Board of Astro.

#### **ENDS**

#### **More Information**

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The information in this report as it relates to Mineral Resources and Exploration Results for the Governor Broome Deposit 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
Sampling	<ul> <li>Air-core drilling was used to obtain 1m samples from target horizons;</li> </ul>
techniques	<ul> <li>Approximately 1.25kg sub-samples were split from the rig cyclone.</li> </ul>
Drilling	Vertical NQ Air-core.
techniques  Drill sample	Good recovery and retention of all size fractions;
recovery	<ul> <li>Holes and cyclone cleaned at completion of each three-metre rod.</li> </ul>
Logging	<ul> <li>All intervals geologically logged during drilling, recording grainsize, sorting, mineralogy, colour, and stratigraphic unit. All chip trays stored for future reference.</li> </ul>
Sub-sampling	Sample preparation via drying and manual pulverisation before removal
techniques and sample	<ul><li>of +3.3mm material;</li><li>100g sub- samples riffle split from remaining sample.</li></ul>
preparation	
Quality of assay data and	<ul> <li>Analysis by Western Geolabs Pty Ltd by its standard HM analytical procedures for HM%, Slimes % (-45micron), and Oversize % (+1mm);</li> </ul>
laboratory tests	<ul> <li>Repeat laboratory sub-sample splits analysed at 1:11.5 ratio.</li> </ul>
Verification of	Sampling carried out under supervision of Competent Person;
sampling and assaying	<ul> <li>Logging carried out by Competent Person;</li> <li>Assay entry by digital capture of laboratory files, with later verification of</li> </ul>
ussaying	significant intervals against geological logging;
	Twinned holes drilled at 1:20 ratio.
Location of data	Holes located using a handheld GPS;
points	• Grid MGA_GDA94, Zone 50;
	<ul> <li>Elevation data interpolated from DGPS survey of 2005 and 2006 drill- holes.</li> </ul>
Data spacing and distribution	1m samples collected and analysed throughout mineralized horizons;      5
distribution	<ul> <li>East Deposit holes drilled on 160m by 80m spacing;</li> <li>West Deposit holes drilled on approximate 120m by 120m spacing;</li> </ul>
	<ul> <li>No sample compositing applied.</li> </ul>
Orientation of	Vertical drilling through horizontal stratigraphy resulted in intersected
data in relation to geological	thickness equivalent to true thickness.
structure	
Sample security	Samples transported from accommodation site to laboratory by courier.
Audits or reviews	Sample techniques, logs, and data reviewed by Competent Person.



#### **Section 2 Reporting of Exploration Results**

Criteria	Commentary
Mineral tenement and land tenure status	<ul> <li>The resources are within Retention Licence, R70/53 held by Governor Broome Sands Pty Ltd, a wholly owned subsidiary of Astro Resources NL. R70/53 has an expiry date of 3/07/21 and is in good standing.</li> </ul>
Exploration done by other parties	<ul> <li>Preliminary air-core drilling and mineralogical work was carried out by Westralian Sands between 1996 and 1998 and mineralogical work was carried out by Iluka between 1998 and 2000;</li> <li>Metals Sands Australia Ltd carried out air-core drilling campaigns between 2005 and 2007 and Astro carried out broad spaced drilling in 2012. This recent drilling infills and extends that coverage.</li> </ul>
Geology	<ul> <li>The Governor Broome Heavy Mineral Deposits occur within a surficial Pleistocene sand unit, the Warren Sands, and in the immediately unconformably underlying Beenup Beds of the Cretaceous Warnbro Group;</li> <li>The Warren Sands vary in thickness from 4m to 9m within the area. They contain HM mineralisation, which increases in grade in the unit's lower few metres;</li> <li>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 in its top few metres;</li> <li>The HM assemblage averages of the order of 53% ilmenite, 6% secondary ilmenite, 3.5% leucoxene, 1.5% Hi-Ti, and 5% zircon for a total of 69% valuable HM.</li> </ul>
Drill hole Information	<ul> <li>See Appendix 2, which lists the 87 Astro air-core drill-holes drilled into the West Resource;</li> <li>HM intercepts are provided for each hole.</li> </ul>
Data aggregation methods	<ul><li>No grade cutting carried out;</li><li>No metal equivalents employed.</li></ul>
Relationship between mineralisation widths and intercept lengths	Vertical drilling through virtually horizontal stratigraphy resulted in intersected thickness equivalent to true thickness.
Diagrams	See Figures.
Balanced reporting	Report gives balanced view of the deposit.
Other substantive exploration data	<ul> <li>2006: Eight composites each of 30 HM sample concentrates scanned by QEMSCAN technology averaged 72% valuable HM plus 19% garnet;</li> </ul>



Criteria	Commentary
	<ul> <li>2012: HM assemblages characterised for composite heavy mineral samples selected to represent the North and East Deposit mineralisation. The concentrates returned an average of 70% valuable HM;</li> <li>2005: Pilot testwork of 400 drill intercepts returned a concentrate containing 80% valuable HM plus 15% garnet;</li> <li>2012: A bulk sample from the North Deposit Indicated Resource was concentrated in a laboratory to simulate wet concentration followed by dry separation of the concentrate. Valuable HM constituted 82% of the concentrate.</li> </ul>

### **APPENDIX 2 – Drill-hole Information**

All holes are vertical

DEPOSIT	HOLE	EAST	NORTH	FROM	то	INTERVAL	НМ
		GDA94	GDA94				
		<b>Z50</b>	<b>Z50</b>	m	m	m	%
WEST	GB2060	352637	6211825	3	7	4	8.2
WEST	GB2061	352644	6211927	3	8	5	5.7
WEST	GB2062	352599	6212041	3	5	2	6.0
WEST	GB2064	352747	6212019	5	7	2	4.4
WEST	GB2065	352517	6211764	4	9	5	8.8
WEST	GB2069	352405	6211721	3	8	5	13.1
WEST	GB2070	352591	6211680	3	6	3	6.9
WEST	GB2071	352631	6211563	3	7	4	5.0
WEST	GB2072	352669	6211439	3	7	4	8.1
WEST	GB2073	352666	6211197	3	7	4	4.9
WEST	GB2074	352797	6211160	3	5	2	2.9
WEST	GB2075	352746	6211556	3	6	3	10.3
WEST	GB2078	352439	6211650	3	8	5	11.3
WEST	GB2081	352517	6211189	3	6	3	4.9
WEST	GB2083	352564	6211445	3	9	6	2.7
WEST	GB2085	352522	6211566	3	9	6	3.3
WEST	GB2086	352521	6211566	3	9	6	3.7
WEST	GB2088	352635	6211099	3	6	3	4.3
WEST	GB2089	352518	6211101	2	7	5	3.0
WEST	GB2091	352424	6210944	3	5	2	2.6
WEST	GB2092	352551	6210942	4	6	2	2.9
WEST	GB2095	352740	6210867	7	9	2	6.3
WEST	GB2097	352579	6210727	6	11	5	3.9
WEST	GB2098	352697	6210713	4	9	5	3.6
WEST	GB2100	352629	6210616	5	7.5	2.5	6.2
WEST	GB2104	352505	6210852	4	6	2	3.4
WEST	GB2105	352393	6210845	4	7	3	3.5
WEST	GB2107	352239	6210716	3	8	5	3.4
WEST	GB2108	352115	6210719	3	7	4	3.4
WEST	GB2111	352318	6210599	4	6	2	3.6
WEST	GB2112	352433	6210592	5	7.5	2.5	7.1
WEST	GB2113	352505	6210596	5	9	4	2.7
WEST	GB2116	352478	6210235	3	6	3	3.2
WEST	GB2117	352378	6210257	3	7	4	2.5
WEST	GB2122	352188	6210478	5	7	2	5.4
WEST	GB2123	352133	6210484	3	6	3	2.5
WEST	GB2124	352200	6210367	3	7	4	3.0
WEST	GB2125	352393	6210128	4	11	7	3.3
WEST	GB2126	352293	6210123	3	9	6	2.6
WEST	GB2127	352173	6210107	6	13	7	3.0
WEST	GB2128	352075	6210108	6	12	6	2.5
WEST	GB2129	352065	6209994	4	10	6	3.8
WEST	GB2130	352174	6210000	3	10	7	3.8
WEST	GB2131	352298	6209997	3	9	6	3.9



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WEST	GB2132	351943	6209880	6	10	4	2.6
WEST	GB2133	351955	6209757	6	12	6	3.8
WEST	GB2134	351960	6209640	6	10	4	2.8
WEST	GB2135	351992	6209393	5	11	6	3.6
WEST	GB2136	352195	6209522	7	12	5	8.1
WEST	GB2137	352170	6209643	5	10	5	4.9
WEST	GB2138	352100	6209840	6	12	6	3.0
WEST	GB2139	352555	6210012	3	8	5	4.0
WEST	GB2141	352420	6209765	5	9	4	3.5
WEST	GB2142	352371	6209955	4	9	5	3.4
WEST	GB2144	352209	6210847	6	11	5	8.0
WEST	GB2145	352353	6210719	4	7	3	5.8
WEST	GB2146	352463	6210714	5	8	3	3.2
WEST	GB2148	352572	6210452	6	11	5	3.0
WEST	GB2149	352582	6210231	4	9	5	3.6
WEST	GB2150	352527	6210118	4	11	7	3.5
WEST	GB2151	352432	6210021	3	9	6	3.2
WEST	GB2152	352515	6209896	5	8	3	5.1
WEST	GB2153	352419	6209883	3	8	5	5.6
WEST	GB2154	352544	6209780	6	8	2	5.9
WEST	GB2155	352406	6209686	5	11.75	6.75	4.1
WEST	GB2156	352639	6209661	4	9	5	3.2
WEST	GB2157	352596	6209603	6	11	5	3.2
WEST	GB2158	352460	6209601	5	7	2	3.5
WEST	GB2159	352327	6209565	6	10	4	5.7
WEST	GB2160	352151	6209749	4	10	6	3.4
WEST	GB2161	352288	6209752	4	11	7	3.5
WEST	GB2162	352059	6209894	6	9	3	4.3
WEST	GB2163	352208	6209896	5	10	5	3.8
WEST	GB2164	351958	6209987	5	10	5	4.4
WEST	GB2165	351957	6209987	5	10	5	2.8
WEST	GB2166	352055	6209640	7	12	5	4.0
WEST	GB2168	352196	6209421	9	12	3	4.3
WEST	GB2173	351761	6209431	6	10	4	3.1
WEST	GB2177	352043	6210256	4	8	4	3.5
WEST	GB2178	351981	6210097	3	13	10	3.2
WEST	GB2179	352044	6210191	6	11	5	3.4
WEST	GB2180	351953	6210189	6	10	4	3.3
WEST	GB2182	351988	6209508	8	11	3	3.7
WEST	GB2183	351999	6209288	6	10	4	2.6
WEST	GB2184	352097	6209537	7	12	5	6.8
WEST	GB2185	352097	6209538	7	12	5	5.4
WEST	GB2187	352098	6209351	7	11	4	6.1

