May 16, 2023

Koppamurra Rare Earths Project, South Australia

Highly successful metallurgical tests point to significantly lower processing costs

Breakthrough testwork shows that removing larger ore particles before processing increases head grade significantly for little reduction in total recovered rare earths

Australian Rare Earths Limited (ASX: AR3) is pleased to announce pivotal metallurgical test results which highlight the potential to significantly reduce capital and production costs at its Koppamurra rare earths project.

The tests demonstrated that the vast majority of the valuable rare earths occur in the smaller particles. By separating the ore through simple beneficiation, the larger particles could be removed from the downstream process.

This resulted in 90 per cent of the magnet rare earths being contained in 64 percent of the ore.

The results are considered transformational as they demonstrate the potential to reduce re-agent consumption, simplify materials handling, reduce the volume of the leach vessels and therefore reduce capital and operating costs significantly.

Acting Managing Director Rick Pobjoy welcomed the results:

"These latest tests by industry experts ANSTO demonstrate that more than 90 per cent of the important magnetic rare earths can be captured in less than two thirds of the mass during primary processing when the maximum feed size is restricted to less than 75 microns.

"This means we could substantially reduce the amount of ore we process substantially, while still maintaining 90 per cent of the valuable rare earths. The potential impact on processing costs and therefore the overall economics of the project and shareholder returns are extremely substantial.

"Further work is underway on this approach in parallel with our drive to continue growing the Koppamurra Resource".

Assay by size – Testwork Outline

ANSTO Minerals (ANSTO) has completed a number of work programs for Australian Rare Earths (AR3) relating to the recovery of rare earths from the Koppamurra deposit. This latest testwork explores the potential for screening the mineralised clay to remove a portion of the overall material while retaining the majority of the REEs and increasing the REE grade.

A scope of work to screen a representative composite sample of the Koppamurra mineral resource and leach the oversize and undersize fractions was prepared by ANSTO. Initial screening work was conducted at 38 µm, with diagnostic leach tests conducted on the oversize and undersize fractions. The oversize fraction was screened further at 45, 75 and 106 µm. Assessment of the screened fractions led to further screening and leaching of a <75 µm fraction.

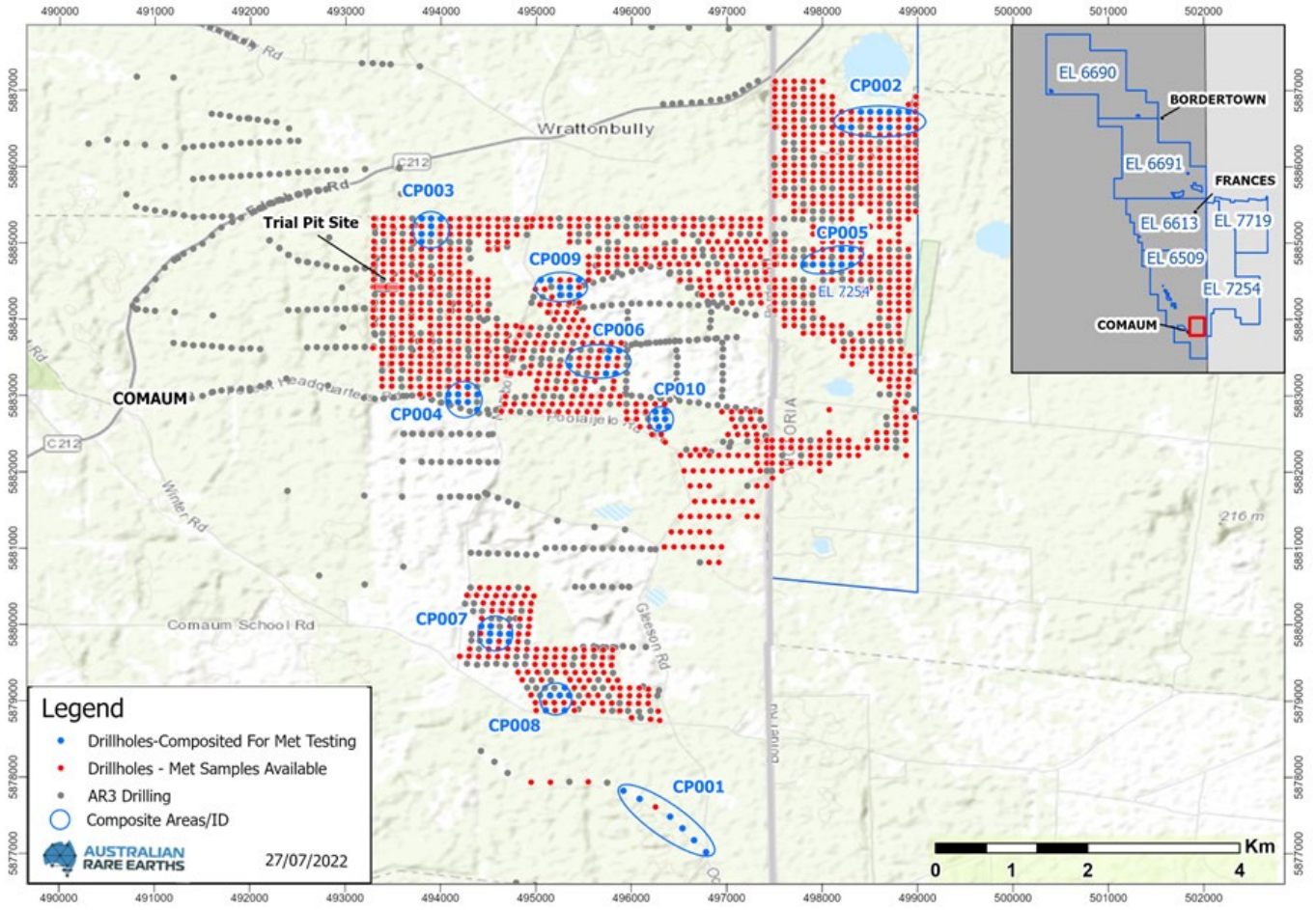

Figure 1 - A composite of five composite samples (CP003, CP004, CP006, CP009 & CP010) representative of the current Koppamurra Mineral Resource were used in this testwork.

The initial screen at 38 µm upgraded the total rare earth + Y oxide (TREYO) in the <38 µm fraction by 37%, with only 60% of the mass. The TREYO grade improved from 1133 ppm in the head to 1557 ppm. Further screening of the >38 µm fraction showed 43% of the remaining REs were present in the <75 µm fractions, with only 14% of the mass. Following assessment of these results, an additional screening test was conducted at 75 µm. The Magnet REE upgrade to the <75 µm fraction was 41%.

Diagnostic leaches were performed on the size fractions generated through this testwork. The leaches were used to identify any bias of rare earth recovery toward one size fraction or other. Diagnostic leaches are conducted at pH 4 and pH 1 and at low solids volumes, establishing baseline rare-earth extraction characteristics of the samples.

Follow up testing from these test results will include repeating the screening at 75 µm across a number of other samples and to test leaching at full slurry density (25 wt%), including optimisation of leach pH as reported previously (ASX: 19/09/2022). This is required to validate the diagnostic results presented here and gather more information on the resulting acid consumption, leach liquor composition and slurry handling at the finer particle size.

Further testwork will also include an investigation of the impact of the addition of MgSO4 to the test lixiviant at various points from pH 1 to pH 4. The results here indicate a positive impact on RE recovery.

	Conditions											
Sample ID	**Reagent**	**pH**	**Time (h)**	**Pr %**	**Nd %**	**Tb %**	**Dy %**	**LRE %**	**HRE %**	**Magnet REE %**	**TREY %**	**TREY-Ce %**
ARE <38 µm	0.3 M MgSO4 (pH 4)	4.0	0.5	13	14	15	14	7	15	14	10	15
ARE <38 µm	H2SO4 (pH 1)	1.0	2.0	42	45	39	33	27	35	43	29	39
ARE >38 µm	0.3 M MgSO4 (pH 4)	4.0	0.5	26	26	24	16	14	17	25	15	22
ARE >38 µm	H2SO4 (pH 1)	1.0	2.0	57	57	50	37	68	39	54	58	45
ARE <75 µm	0.3 M MgSO4	4.0	0.5	18	20	20	19	11	20	20	14	20
ARE <75 µm	0.3 M MgSO4	1.0	2.0	**59**	**62**	**52**	**53**	39	54	**60**	42	55
ARE <75 µm	H2SO4 (pH 1)	1.0	2.0	50	52	45	45	38	45	50	39	46

Table 1 - Magnet Rare Earth recovery (%) at various size fractions and test conditions

The announcement has been authorised for release the by the Board of AR3 Limited.

For further information please contact:

AR3 Limited
Rick Pobjoy
Acting Managing Director
T: 1 300 646 100

Media Enquiries
Nicholas Read / Paul Armstrong
Read Corporate
T: 08 9388 1474

Competent Person's Statement

The information in this report that relates to metallurgical results is based on information compiled by Australian Rare Earths Limited and reviewed by Mr. Jon Weir who is the Technical Director – Metallurgy of Wallbridge Gilbert Aztec and a Member of the Australian Institute of Mining and Metallurgy (M AusIMM). Mr. Weir has sufficient experience that is relevant to the metallurgical testing which was undertaken to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Weir consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

Listing Rule 5.23 disclosure

The Company confirms that it is not aware of any new information or data that materially affects the Exploration Results and/or the estimates of Mineral Resources in this release, and in respect of the estimates of Mineral Resources reported, that all material assumptions and technical parameters underpinning the estimates continue to apply and have not changed.

About Australian Rare Earths Limited

Australian Rare Earths is committed to the timely exploration and development of its 100% owned, flagship Koppamurra Project, located in South Australia and Victoria. Koppamurra is a prospective ionic clay hosted rare earth deposit, uniquely rich in all the elements required in the manufacture of rare earth permanent magnets which are essential components in electric vehicles, wind turbines and domestic appliances.

The Company is focused on executing a growth strategy that will ensure AR3 is positioned to become an independent and sustainable source of rare earths, playing a pivotal role in the global transition to a green economy.

Appendix I

JORC Table 1 – Section 2, Reporting of Exploration Results

Section 2 Reporting of Exploration Results		
Criteria	**Explanation**	**Comment**
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	*Koppamurra Project comprises of a granted South Australian Exploration Licences (EL), EL6509, EL6613, EL6690 and EL6691, along with Victorian EL007254 covering a combined area of ~4,000 km2 which is in good standing.* *EL6509 is within 100m of a Glen Roy Conservation Park and the Naracoorte Caves National Park, the latter of which is excised from the tenement. The License area contains several small Extractive Mineral Leases (EML) held by others, Native Vegetation Heritage Agreement areas, as well as the Deadman's Swamp Wetlands which are wetlands of national importance.* *A Native Title Claim by the First Nations of the South East #1 has been registered but is yet to be determined. The claim area includes the areas covered by EL's 6509, 6613, 6690 and 6691.* *The exploration work was completed on the tenements (EL 6509 and EL6613) in South Australia and EL007254 which are 100% owned by the company Australian Rare Earths Ltd.* *The Exploration License EL6509 original date of grant was 15/09/2020 with an expiry date of 14/09/2022.* *The Exploration License EL6613 original date of grant was 07/07/2021 with an expiry date of 06/07/2027.* *The Exploration License EL007254 original date of grant was 29/04/2021 with an expiry date of 28/04/2024.*

		Details regarding royalties are discussed in chapter 3.4 of Australian Rare Earths Prospectus dated 7 May 2021.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	*Exploration activities by other exploration companies in the area have not previously targeted or identified REE mineralisation.* *Historical exploration activities in the vicinity of Koppamurra include investigations for coal, gold and base metals, uranium, and heavy mineral sands.* *Historical exploration by other parties is detailed in Chapter 7 of Australian Rare Earths Prospectus dated 7 May 2021.*
Geology	*Deposit type, geological setting and style of mineralisation.*	*The ionic clay hosted REE mineralisation at Koppamurra is hosted by clayey sediments interpreted to have been deposited onto a limestone base (Gambier Limestone) and accumulated in an interdunal, lagoonal or estuarine environment which has been extensively mapped east of the Kanawinka fault in SE SA. A dedicated post-doctoral research program investigating the source of the REE at Koppamurra is ongoing, with no definitive source of the REE confirmed to date although preliminary results of this study have ruled out the alkali volcanics in south-eastern Australia which was originally considered. Mineralogical test work conducted on clay samples from the project area established that the dominant clay minerals are smectite and kaolin, and that the few REE-rich minerals detected during the scanning electron microscope (SEM) investigation were not considered inconsistent with the suggestion that a significant proportion of REE are distributed in the material as adsorbed elements on clay and iron oxide surfaces.*

Drill hole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill*	*The material information for drill holes relating to this report are contained within Appendices of this release.*

	holes: *- easting and northing of the drill hole collar* *- elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* *- dip and azimuth of the hole* *- down hole length and interception depth* *- hole length.* *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	

Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*	*No metal equivalents or data aggregation methods have been used.*

	The assumptions used for any reporting of metal equivalent values should be clearly stated.	
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.* *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	*All intercepts reported are down hole lengths.* *The mineralisation is interpreted to be flat lying. Morphology of the mineralised unit is influenced by the morphology of the undulating limestone basement below. Drilling is vertical perpendicular to mineralisation. Any internal variations to REE distribution within the horizontal layering was not defined, therefore the true width is considered not known.*
Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	*Diagrams are included in the body of this release.*
Balanced reporting	*Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	*This release contains all drilling results that are consistent with the JORC guidelines. Where data may have been excluded, it is considered not material.*

Other substantive	*Other exploration data, if meaningful and material, should be reported*	*All known relevant exploration data has been reported in this release.*
exploration data	*including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	*AR3 intend to continue to define the Koppamurra resource during 2023. This will include (but not limited to) drilling, assay, ground based geophysical surveys and further metallurgical testwork.*

Appendix II

Aircore Drillhole Collars contributing to material provided for metallurgical test work

Hole_ID	East	North	RL	Drill Meth	Down Hole Width (mm)	Total Depth EOH (m)	Azim	Dip
KM1198	493793	5885320	96.7	Air-Core	76	8	0	-90
KM1199	493895	5885317	97.3	Air-Core	76	12	0	-90
KM1200	493995	5885317	94.9	Air-Core	76	18	0	-90
KM1202	493891	5885218	98.2	Air-Core	76	9	0	-90
KM1204	493797	5885117	98	Air-Core	76	6	0	-90
KM1205	493894	5885116	98.1	Air-Core	76	9	0	-90
KM1209	493799	5885019	97.8	Air-Core	76	6	0	-90
KM1418	495827	5883287	110.4	Air-Core	76	6	0	-90
KM1419	495736	5883291	109.5	Air-Core	76	6	0	-90
KM1423	495350	5883395	104.3	Air-Core	76	6	0	-90
KM1427	495746	5883397	107.3	Air-Core	76	6	0	-90
KM1430	495747	5883493	105.9	Air-Core	76	9	0	-90
KM1445	495756	5883600	108.8	Air-Core	76	6	0	-90
KM1446	495864	5883592	111.4	Air-Core	76	9	0	-90
KM1591	495443	5884516	105.6	Air-Core	76	12	0	-90
KM1594	495143	5884513	101.9	Air-Core	76	8	0	-90
KM1595	495046	5884515	101.4	Air-Core	76	11	0	-90
KM1597	495250	5884415	101.3	Air-Core	76	9	0	-90
KM1598	495347	5884421	100.4	Air-Core	76	18	0	-90
KM1600	495447	5884320	105.8	Air-Core	76	6	0	-90
KM1601	495349	5884320	103.3	Air-Core	76	6	0	-90
KM1602	495265	5884317	103.4	Air-Core	76	6	0	-90
KM1608	496253	5882694	111.2	Air-Core	76	12	0	-90
KM1609	496351	5882689	110.9	Air-Core	76	9	0	-90
KM1610	496376	5882796	109.5	Air-Core	76	15	0	-90
KM1611	496245	5882792	112	Air-Core	76	12	0	-90
KM1622	496284	5882591	111.3	Air-Core	76	9	0	-90
KM1623	496375	5882593	111.6	Air-Core	76	9	0	-90
KM1672	494380	5882815	102.8	Air-Core	76	6	0	-90
KM1674	494378	5883015	99.4	Air-Core	76	6	0	-90
KM1690	494080	5883007	101.2	Air-Core	76	5	0	-90
KM1691	494280	5883112	99.9	Air-Core	76	6	0	-90
KM1693	494181	5883019	100.6	Air-Core	76	6	0	-90
KM1694	494281	5882916	99.6	Air-Core	76	6	0	-90
KM1695	494178	5882914	99.6	Air-Core	76	6	0	-90
KM1696	494081	5882916	99.8	Air-Core	76	3	0	-90

Appendix III

Drillhole intervals used for the material provided for metallurgical test work

CP_#	Hole_ID	Sample_ID	Depth_From	Depth_To
CP003	KM1198	671503	2	3
CP003	KM1198	671504	3	4
CP003	KM1198	671505	4	5
CP003	KM1198	671506	5	6
CP003	KM1199	671510	1	2
CP003	KM1200	671525	4	5
CP003	KM1202	671548	0	1
CP003	KM1204	671564	1	2
CP003	KM1204	671565	2	3
CP003	KM1205	671570	1	2
CP003	KM1205	671571	2	3
CP003	KM1209	671613	4	5
CP004	KM1672	676211	2	3
CP004	KM1674	676223	2	3
CP004	KM1690	676349	2	3
CP004	KM1691	676353	1	2
CP004	KM1691	676354	2	3
CP004	KM1693	676366	2	3
CP004	KM1694	676372	2	3
CP004	KM1695	676378	2	3
CP004	KM1695	676379	3	4
CP004	KM1696	676382	0	1
CP006	KM1418	673808	2	3
CP006	KM1418	673809	3	4
CP006	KM1419	673814	2	3
CP006	KM1423	673847	2	3
CP006	KM1427	673875	4	5
CP006	KM1430	673896	4	5
CP006	KM1430	673897	5	6
CP006	KM1445	674028	2	3
CP006	KM1446	674036	4	5
CP006	KM1446	674037	5	6
CP009	KM1591	675513	7	8
CP009	KM1594	675537	4	5

CP009	KM1595	675546	5	6
CP009	KM1595	675547	6	7
CP009	KM1597	675560	5	6
CP009	KM1598	675572	8	9
CP009	KM1598	675573	9	10
CP009	KM1598	675574	10	11
CP009	KM1598	675575	11	12
CP009	KM1600	675591	3	4
CP009	KM1600	675592	4	5
CP009	KM1601	675595	1	2
CP009	KM1602	675601	1	2
CP010	KM1608	675648	7	8
CP010	KM1608	675649	8	9
CP010	KM1609	675657	4	5
CP010	KM1609	675658	5	6
CP010	KM1610	675668	6	7
CP010	KM1610	675669	7	8
CP010	KM1610	675670	8	9
CP010	KM1611	675683	6	7
CP010	KM1611	675684	7	8
CP010	KM1611	675685	8	9
CP010	KM1622	675812	7	8
CP010	KM1623	675820	6	7
CP010	KM1623	675821	6	7