Rare Earth Ionic Adsorption Clays Confirmed

ABx's rare earth elements (REE) mineralisation at Deep Leads proven to be ionic adsorption clay (IAC), the major source of permanent magnet REEs

Excellent extraction rates of 48% to 71% achieved from the main type of REE mineralisation under standard desorption test conditions, which represent low-acid, low-cost processing

Drilling continues at Deep Leads. Six channels of this main type of mineralisation have been identified over considerable distances

ABx Group Limited (ASX: ABX) (**ABx**) has received its first 12 desorption test results on rare earth element (REE) samples from its Deep Leads deposit in northern Tasmania (see Figures 2 and 3). The desorption tests were conducted by ANSTO in Sydney, which has extensive experience in metallurgical testing of clay-hosted rare earth deposits worldwide. The tests were conducted at "standard" desorption conditions of 0.5 M ammonium sulfate at pH 4 which are low-acid, low-cost processing conditions for ionic adsorption clay REE.

Figure 1
Sunrise at a Deep Leads drill site, northern Tasmania

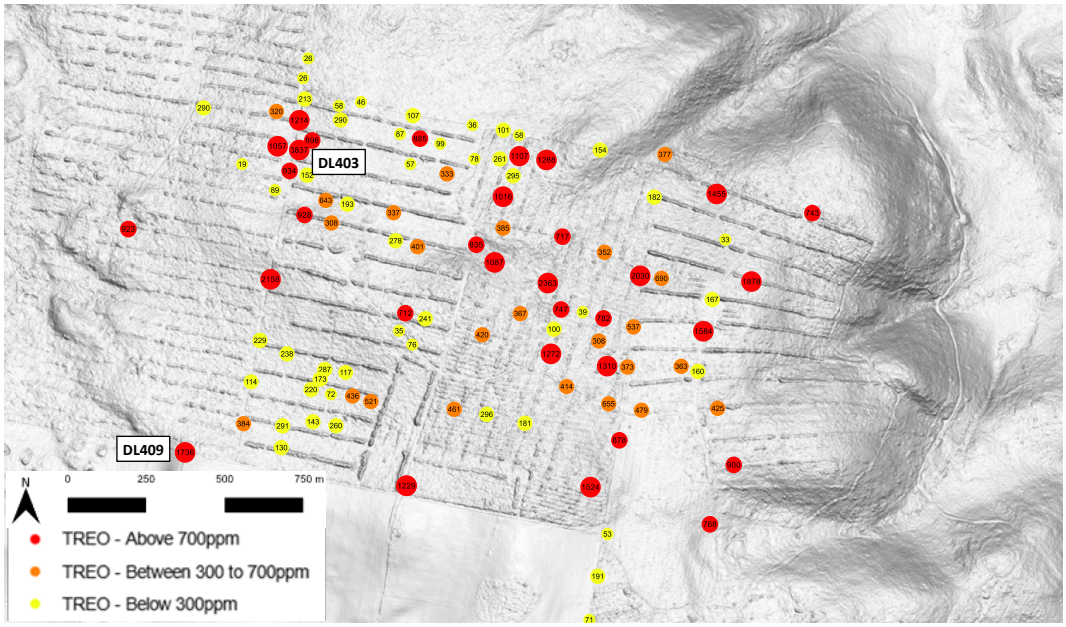

Figure 2
Deep Leads drillhole REE grades as total rare earth oxide (TREO)

REE in holes DL403 and DL409 (marked) returned excellent extraction rates – see Table 1

ABx purposely tested a range of mineralisation types from Deep Leads, Portrush and Windbreak deposits (see Figure 3) to improve its understanding of the factors affecting REE extraction rates and, most importantly, to confirm that Deep Leads contains ionic adsorption clay (IAC) mineralisation.

The five best extraction results were from holes DL403 and DL409 (see Figure 2 and Table 1) which represent ABx's main target REE mineralisation at Deep Leads discovered to date [1]. REE extractions in these five samples were excellent, ranging from 40% to 75% of each of the permanent magnet REE (Nd, Pr, Dy, Tb) and 48% to 71% of the total rare earths except cerium. It is significant that these results were obtained using ammonium sulfate at pH 4, which is similar to the conditions used in China for purely ionic adsorption clay type deposits. Some other clay-hosted REE deposits can require significantly more acid to achieve similar levels of REE extraction.

ABx CEO, Mark Cooksey commented, "It is an exciting step forward to identify that high REE extraction can be achieved from our REE samples under standard, low-cost desorption conditions. It provides more confidence that the ABx REE deposits exhibit an attractive combination of good REE grades and high extraction at low cost."

ABx Executive Director, Ian Levy said; "We developed an exploration technology to find the best type of REE mineralisation and we are now drilling to expand its size. This testwork confirms that ABx has discovered potentially economic REE mineralisation in Tasmania and it occurs in land that is amenable for production in an environmentally sustainable manner."

The distribution and composition of REE mineralisation in basement rocks is part of ABx's exploration technology. As expected, REE extraction from basement rock probably requires a different processing route than the standard conditions reported here for ABx's IAC type of mineralisation, which is the main target for ABx's exploration.

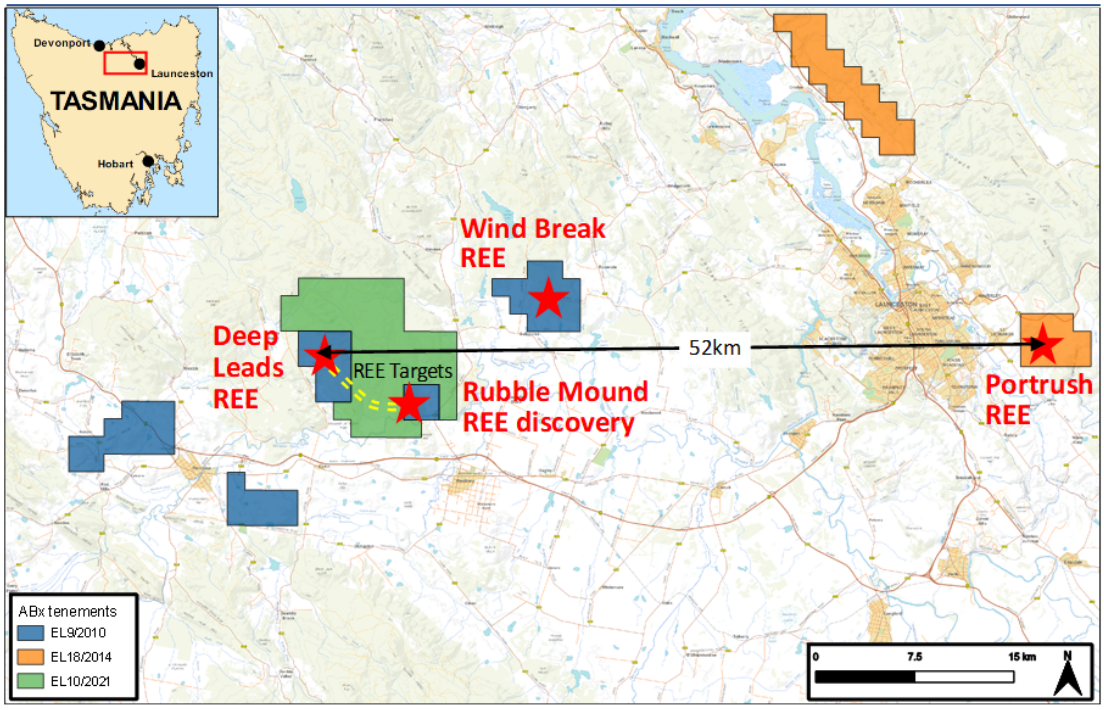

Figure 3 ABx leases in the 52km wide REE province of northern Tasmania.

1 See ASX release – ABX fourth rare earth discovery confirms 52km REE province dated 16 Mar 2022

Drilling Program

ABx has been conducting further drilling of the Deep Leads deposit since late April and awaits assay results. However, geological features discovered during this drilling have justified drilling holes in outlying greenfield areas not previously contemplated. These major holes in greenfield areas are subject to a Tasmanian State Government, Exploration Drilling Grant Initiative (EDGI) for co-funded exploration drilling projects.

The desorption test results will provide further guidance to the drilling program, and ABx is improving its ability to identify the type of mineralisation where the REEs can be easily desorbed. The drilling program is planned to continue into June.

ABx National Operations Manager, Nathan Towns commented; "ABx and Tasmania's e-drill have developed a drilling technology for this unusual mixture of clays, hard cap, slurries, gravels, sands, and very hard basement rock. Most holes now reach target depths and we have developed a push-tube method to collect cores from important strata. We are also trialling two geophysical methods to accelerate resource delineation. The mud, ice, short days, pandemic and forestry burn-offs will not stop this important exploration program."

This announcement is approved for release by the board of directors.

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Table 1: Extraction of REEs using 0.5 M ammonium sulfate at pH 4

Hole		DL403				DL409
Depth (m)		6-7	7-8	8-9	9-10	8-9
Head grade (ppm)	La_2O_3	393	461	419	439	232
	CeO_2	162	258	139	138	581
	Pr_6O_{11}	149	182	162	173	62
	Nd_2O_3	659	804	717	772	240
	Sm_2O_3	188	238	211	238	51
	Eu_2O_3	64	81	73	84	17
	Gd_2O_3	196	243	225	248	61
	Tb_4O_7	32	41	38	42	9
	Dy_2O_3	174	231	213	230	59
	Ho_2O_3	34	44	40	42	13
	Er_2O_3	91	118	109	110	36
	Tm_2O_3	12	17	16	16	5
	Yb_2O_3	74	98	90	94	29
	Lu_2O_3	11	14	13	14	5
	Y_2O_3	845	1026	993	900	364
	TREO	3,083	3,856	3,457	3,538	1,766
Extraction (%)	La	70%	61%	66%	50%	76%
	Ce	13%	8%	10%	6%	1%
	Pr	**61%**	**48%**	**55%**	**40%**	**69%**
	Nd	**63%**	**50%**	**58%**	**41%**	**68%**
	Sm	59%	47%	54%	37%	58%
	Eu	77%	58%	67%	44%	62%
	Gd	77%	65%	70%	51%	70%
	Tb	**75%**	**61%**	**66%**	**47%**	**61%**
	Dy	**75%**	**63%**	**68%**	**46%**	**55%**
	Ho	77%	64%	70%	51%	57%
	Er	75%	63%	67%	50%	51%
	Tm	73%	60%	64%	47%	50%
	Yb	70%	58%	61%	43%	46%
	Lu	65%	58%	61%	44%	43%
	Y	79%	71%	73%	60%	66%
	TREE-Ce	**71%**	**60%**	**65%**	**48%**	**67%**

Extraction (%) is the percentage of the elements that dissolved into the leach solution. The permanent magnet (REE) are highlighted in light green. These are praseodymium (Pr), neodymium (Nd), terbium (Tb) and dysprosium (Dy).

ABx has been exploring for these permanent magnet REE in ionic adsorption clay deposits, which can be developed rapidly and at low cost with low technology risk.

Qualifying statements

General: The information in this report that relates to Exploration Information is based on information compiled by Dr Mark Cooksey and Ian Levy. Ian Levy is a member of The Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Dr Cooksey is a senior chemical engineer and Mr Levy is a qualified geologist. Dr Cooksey is CEO and Mr Levy is a director of ABx Group Limited. The information relating to Exploration Information and Mineral Resources in Tasmania has been prepared or updated under the JORC Code 2012. Mr Levy has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity which has been 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 Levy has consented in writing to the inclusion in this report of the Exploration Information in the form and context in which it appears.

JORC Code, 2012 Edition – Table 1 report

Section 1 Sampling Techniques and Data (Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• Drill holes samples to 25 metres maximum depth but typically to 12 metres depth
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Reverse circulation rotary percussion and push-tube coring
Drill sample recovery	• *Method of recording & assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery & ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Weight tests indicated reliable sample recovery
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Geologically logged in detail by senior geologists. Every sample photographed, with photos and logs and assays entered into ABx's proprietary ABacus database.
Sub-sampling techniques	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	• Chips are subsampled using bauxite shovel and quartering method in accordance with ISO standards

Criteria	JORC Code explanation	Commentary
and sample preparation	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external lab checks) & whether acceptable levels of accuracy (ie lack of bias) & precision have been established.*	• Assaying done at NATA-registered commercial labs of ALS Brisbane Australia and Labwest Minerals Analysis in Western Australia. Duplicate interlab assays done. • Desorption extraction tests were conducted by ANSTO at Lucas Heights, Sydney NSW with assays done at ALS Brisbane.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• All assaying done at NATA-registered commercial laboratories of ALS Brisbane Australia and Labwest Minerals Analysis Pty Ltd in Western Australia. Duplicate interlab assays showed excellent correspondence.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• GPS hole locations have been tested for accuracy on many prospects, all satisfactorily – within 1m.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Drilling typically at 50 to 75 metre spacing on mineralised prospects
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Vertical holes through flat-dipping bauxite is as good as it gets
Sample security	• *The measures taken to ensure sample security.*	• Samples collected and assembled onto pallets every day
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Several audits confirmed reliability

Section 2 Reporting of Exploration Results *(Criteria listed in the preceding section also apply to this section.)*

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Satisfactory to excellent. All tenements are unencumbered.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• ABx is the first company to explore for Rare Earth Elements in northern Tasmania.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Bauxite deposit formed on Lower Tertiary basalts

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *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.*
		• GPS location.
		• Airborne Radar RL topography
		• Lidar topography contoured at 1m height intervals
		• All holes are short straight vertical holes

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.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• All data are presented.
Relationship between mineralisation widths & 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').*	• Mineralisation typically 3 to 6 metres thick and Drillholes are sampled at 1 metre intervals
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.*	• N/A
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.*	• All new results are reported in this report

Criteria	JORC Code explanation	Commentary
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• N/A
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.*	• Step-out drilling over a wider area has been planned, work plans submitted, and new drill rig configurations have been developed.

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