ALVO
ASX: ALV

Metallurgical Tests Confirm Bluebush as Ionic Adsorption Clay REE Project

Exceptional magnet rare earth extractions up to 83% using ammonium sulphate solution

HIGHLIGHTS

- **Initial metallurgical testwork on auger samples shows excellent extractions of rare earth elements (REE)** using industry standard ammonium sulphate solution (AMSUL) .
- **High-value magnet rare earths (MRE) recovery rates using weakly acidic (pH 4) AMSUL at ambient temperatures achieved the following extractions (after 30 minutes):**
  - Neodymium (Nd): up to 89% averaging 60%.
  - Praseodymium (Pr): up to 86%, averaging 57%.
  - Dysprosium (Dy): up to 53%, averaging 37%.
  - Terbium (Tb): up to 69%, averaging 48%.
  - **Total MRE (Nd,Pr,Dy +Tb): up to 83%, averaging 56%.**
- The results show that excellent REE desorption was achieved across samples taken from the Boa Vista and Sao Bento prospects **using industry standard conditions and crucially confirms that the Bluebush Project is an ionic (adsorption) clay REE project.**
- Metallurgical samples will be tested from current diamond drilling to target high-grade zones and further optimise recovery ratios.
- Diamond drilling continues at the highest grade MRE zones, to test the depth profile and extent of the ionic clay. Auger results include results up to 3m @ 3,415ppm TREO at EOH.
- Truck mounted auger drilling continues to test extents of the mineralisation (open in all directions) and some handheld auger is also underway to test for new regional prospects.

REGISTERED ADDRESS
Alvo Minerals Limited
ACN 637 802 496

Units 8-9, 88 Forrest Street
COTTESLOE WA 6011
Australia
www.alvo.com.au

MANAGEMENT TEAM
Graeme Slattery – Non-Executive Chairman
Rob Smakman – Managing Director
Beau Nicholls – Non-Executive Director

E: info@alvo.com.au
P: +61 8 6314 1424

PROJECTS
Palma VMS Cu/Zn Project
Bluebush REE Project

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Alvo Minerals Limited (ASX: ALV) ("**Alvo**" or **the** "**Company**") is pleased to announce results from initial metallurgical testwork undertaken on auger drill samples from the Bluebush Ionic Clay Rare Earth Project ("**Bluebush**" or "**The Project**"). Bluebush is located on the northern half of the Serra Dourada granite, the same host rock of the Serra Verde Ionic Clay REE deposit ("**Serra Verde**"), believed to be the only ionic clay project currently being commissioned outside of China.

The results confirm the status of Bluebush as an ionic clay (adsorption) REE project, important due to the simpler potential mining and processing costs with associated lower capital and operating costs than other hard rock or simple clay hosted REE prospects.

Rob Smakman, Alvo's Managing Director commented on this critical step:

"This is a significant step forward for Bluebush with the confirmation of Ionic clay adsorption hosted mineralisation at both Boa Vista and Sao Bento. The results are outstanding for initial metallurgical testwork with individual samples of MRE's recovering up to 83%.

We have said from when we acquired this exciting project, there were three things we wanted to clearly demonstrate during the due diligence period: ***Scale, Grade, and Ionic Clay (Adsorption) Mineralisation****. Our results released to date have demonstrated high grades of TREO and MREO near surface and over broad areas at both Boa Vista and Sao Bento prospects, covering the potential size and grade questions. The final, and possibly the most important factor, was establishing the presence of ionic clay adsorption hosted mineralisation. The testwork released today shows this.*

With samples from over 130 auger holes still in the lab, ongoing diamond drilling, regional exploration through handheld auger drilling and the initiation of the Loupe geophysical surveys, we expect there will be plenty to report leading into the end of CY2023 from the Bluebush Ionic REE Project."

Bluebush Metallurgical Results

The results reported here are from auger drilling at the Boa Vista and Sao Bento prospects, part of the larger Bluebush Project (see Figure 1). Samples were collected at 1-2m intervals and sent to the SGS GEOSOL lab in Goiania and Belo Horizonte, Brazil.

Standard sample preparation at the lab (see Appendix 1) was undertaken before a sample was screened to -4mm. The ionic adsorption clay-hosted rare earth element leach test used a diluted solution of 0.5 molar ammonium sulphate at room temperature and a pH 4 for 30 minutes. Recoveries above 30% are considered by Alvo to confirm the ionic nature of the mineralisation.

Future metallurgical investigations will be designed using the follow-up auger drilling and diamond drilling samples to improve the overall MREO recoveries and develop a more complete understanding of the nature of the clays. It is important to note that the results of the AMSUL desorption stage are un-optimised, and further work to seek to further improve REE extractions is being planned.

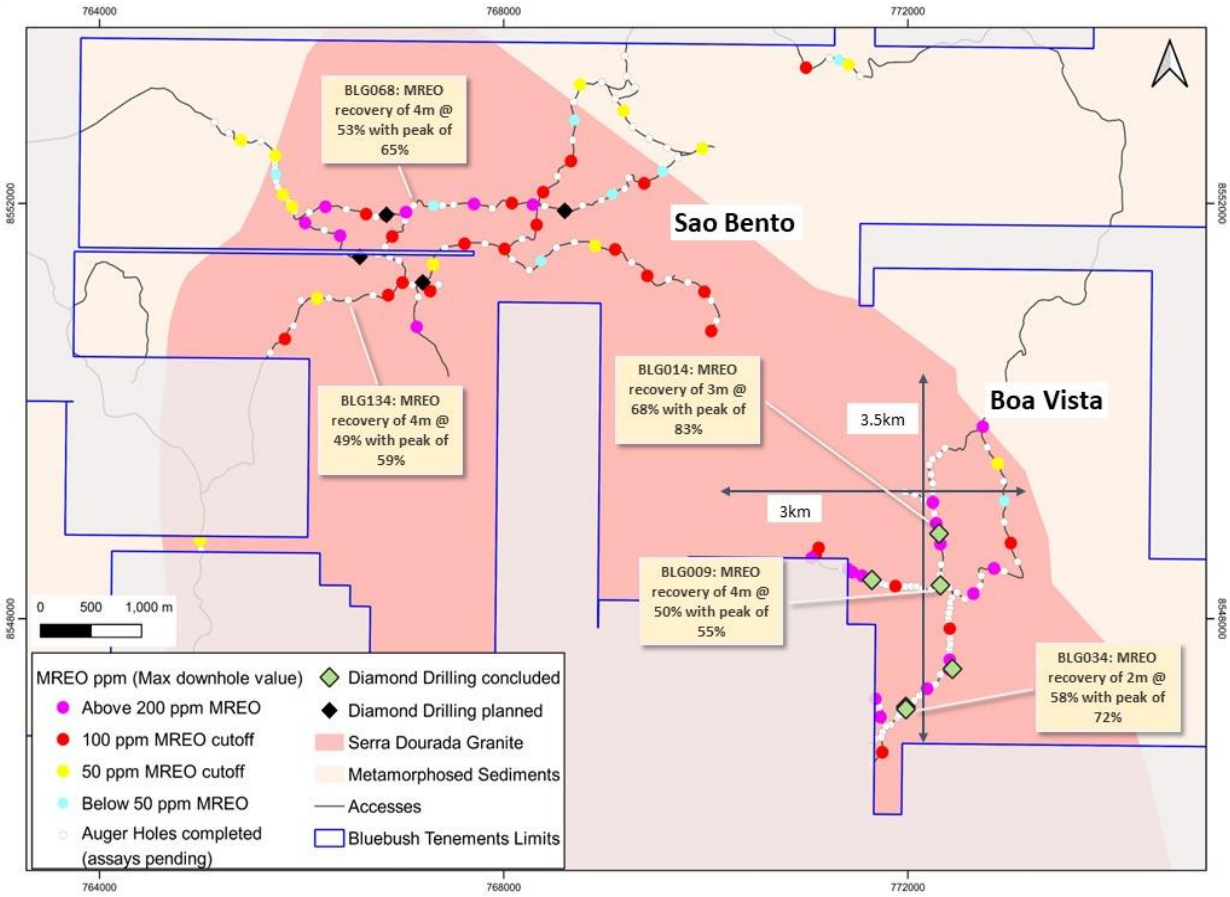

Figure 1: *Bluebush Ionic Clay MREO Project metallurgical test results, auger drill results and completed drilling*

Results are presented in Table 1 and include overall recoveries of the Total REO as well as the more valuable and important MREOs (see Figure2).

Table 1: *Bluebush Ionic Clay MREO Project metallurgical test results*

Prospect	Drill Hole	Interval			Assayed Head (ppm)			Elemental Recovery				MREO Recovery	TREO-Ce Recovery
		From	To	m	TREO	TREO-Ce	MREO	Nd %	Pr %	Dy %	Tb %	%	%
Boa Vista	BLG0009	4	5	1	1,262	765	359	55%	52%	39%	50%	53%	56%
		5	6	1	1,393	829	396	57%	54%	42%	54%	55%	56%
		6	7	1	1,504	856	357	43%	40%	30%	38%	41%	43%
		7	8	1	1,237	784	322	51%	48%	35%	43%	49%	
Boa Vista	BLG0014	4	5	1	813	666	203	**89%**	**86%**	**53%**	**69%**	**83%**	**72%**
		5	6	1	1,075	636	243	49%	47%	41%	51%	47%	47%
		6	7	1	773	901	184	**82%**	**78%**	**41%**	**57%**	**73%**	**59%**
Boa Vista	BLG0034	4	5	1	1,255	1,025	269	**83%**	**80%**	**32%**	**49%**	**72%**	**51%**
		5	6	1	1,355	1,201	286	50%	48%	24%	33%	44%	33%
Sao Bento	BLG0068	0	2	2	514	269	93	70%	68%	40%	50%	65%	60%
		2	4	2	567	350	117	42%	40%	32%	39%	41%	41%
Sao Bento	BLG0134	0	2	2	632	422	134	63%	60%	38%	54%	59%	54%
		2	4	2	797	445	177	41%	39%	28%	36%	39%	38%
	Average				**1,014**	**704**		**60%**	**57%**	**37%**	**48%**	**56%**	**51%**

These results, for initial tests using unoptimised conditions are very considered to be excellent. The average recovery of the low temperature magnet rare earths (Pr + Nd) was 58% and the average recovery of the more valuable high temperature magnets REEs, Tb + Dy was 42%. Total MREO recoveries were as high as 83% for an induvial sample, averaging 56%.

The initial testwork results demonstrates that excellent REE desorption was achieved using industry standard conditions and confirms that REE mineralization at the Bluebush Project is an Ionic (Adsorption) Clay Deposit.

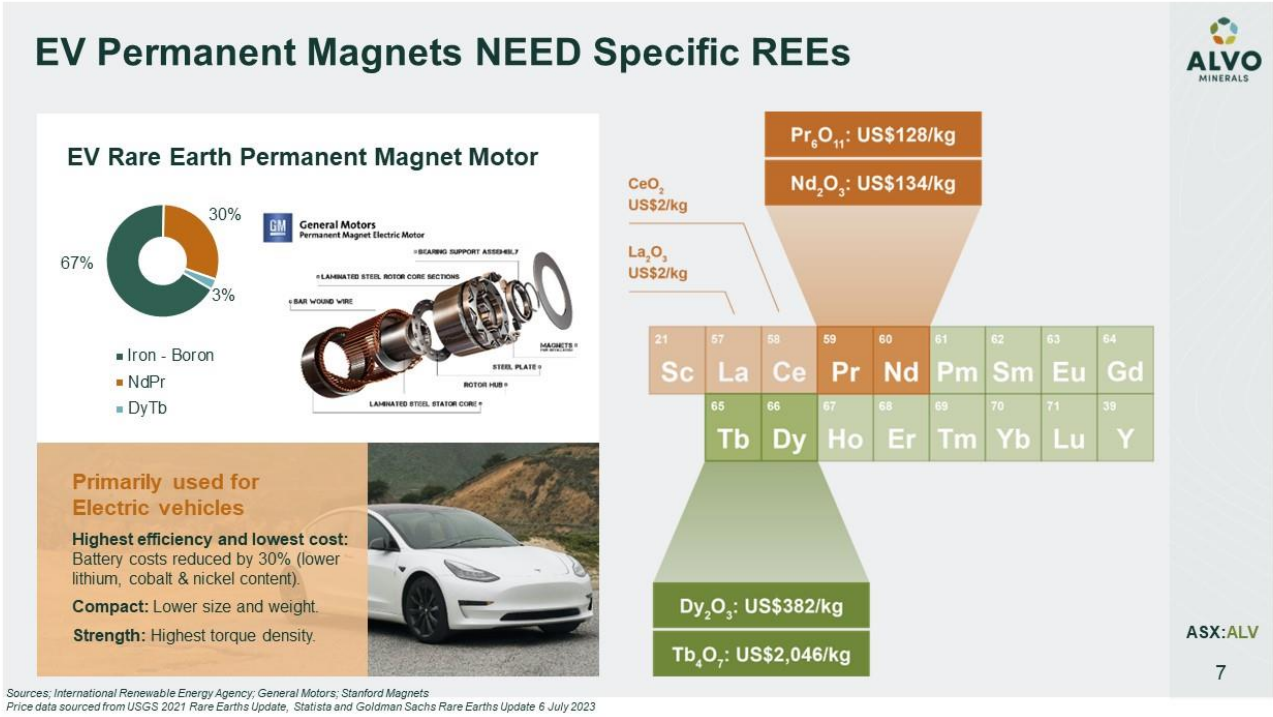

Figure 2: *Magnet Rare Earth Elements (MREOs) are primarily used for permanent magnet motors in electric vehicles. High-value MREOs are highlighted with their relative values[1], with the oxides of Dy and Tb the highest of all the MREOs.*

[1] Sources: International Renewable Energy Agency; General Motors; Standford Magnets. Price data sourced from USGS 2021 Rare Earths Update, Statista and Goldman Sachs Rare Earths Update 6 July 2023

Alvo's Bluebush Exploration Strategy and Future Work

Alvo is uniquely positioned to rapidly explore and advance Bluebush due to its existing exploration infrastructure, personnel and the equipment the Company has on site in Palmeiropolis which is 15km km away from Bluebush.

The Bluebush Project area will be prioritised within Alvo's wider Brazilian exploration schedule, cognisant of the 6-month (extendable by agreement) due diligence period (expiring in December 2023).

As a systematic, innovative and accelerated exploration program (see Figure 4), Alvo intends to:

- Continue diamond drilling across Bluebush targeting a better understanding of the saprolite depth profile. Drill core will also be saved for any resource estimation and metallurgical sampling purposes in the future.
- Utilise the Loupe Portable Electromagnetic survey system (now operational onsite), to map the thickness and extent of saprolite/clay horizons to prioritise ongoing exploration.
- Continue auger drilling using Alvo's truck-mounted auger drill rig that to date has completed 210 holes for 1,669m at Bluebush.
- Use hand-held auger drilling to access targets in more remote areas of the Project (now underway).
- Continue the soil sampling and mapping program, covering areas towards the middle of the Serra Dourada granite.
- Continue the systematic sampling of the auger and soil samples that are dried overnight, sieved using the SciApps X-555 portable XRF analyzer. This analyzer has a higher voltage, providing higher sensitivity for strategic metals, including REEs.
- Continue sending samples from the auger and diamond drilling in an independent lab in Brazil for analysis.

***Figure 4**: Alvo's auger rig drilling at Bluebush REE Project (Boa Vista Prospect top and bottom left). Loupe Electromagnetic equipment in action at Boa Vista (top right) and SciApps X-555 portable XRF analyzer in action at Alvo's core shed (bottom right).*

Bluebush REE Project

Alvo has an option agreement with Mata Azul SA (**Mata Azul** or **Project vendors**) to acquire 100% of the Bluebush REE Project. Alvo has six months to complete due diligence on the Project to its satisfaction, after which it can purchase the Project. The due diligence period expires in December 2023 but can be extended by agreement.

Bluebush neighbours Alvo's Palma VMS Project (see Figures 1 & 3) facilitating due diligence and exploration. Bluebush is considered highly prospective for the high value MREOs hosted in surficial saprolites, classified as the highly valued ionic adsorption clay type.

Ionic clay hosted REE deposits are highly favoured due to the relatively simple and environmentally sustainable processing required to create a REE oxide concentrate. These ionic clay hosted prospects also have relatively high levels of HREO[2] and MREO[3]. Ionic clays are hosted in near surface clays, making mining a relatively simple process.

Bluebush is along strike from, and on the same biotite-rich granitic intrusion called Serra Dourada, host of the Serra Verde Ionic Clay REE Project, the only ionic clay REE project currently in the commissioning phase in the world outside of China. Serra Verde is expecting to commence production in late CY2023[4].

Serra Verde has an estimated Mineral Resource[5] of 911Mt @ 1,200ppm TREO and an Ore Reserve of 350Mt @ 1,500ppm TREO. With an elevated percentage of the higher value heavy and magnet REEs, Serra Verde is projecting a mine life of over 20 years.

Alvo is using the due diligence period to seek to verify the historical results through drilling and will also apply systematic exploration across the tenure to better understand the potential of the Project.

This announcement has been approved for release by the Board of Alvo Minerals Limited.

ENQUIRIES

For more information contact:

Rob Smakman
Managing Director
Alvo Mineral Limited
rob@alvo.com.au
+61 402 736 773

Media or broker enquiries:

Fiona Marshall
Senior Communications Advisor
White Noise Communications
fiona@whitenoisecomms.com
+61 400 512 109

[2] **HREO Heavy rare earth oxides** are defined by their higher atomic weights relative to light rare earth oxides. HREOs include oxides of gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu) and include scandium (Sc) and yttrium (Y). Alvo's results do not include Sc. Uses include computer and phone displays, and fibre optic cables.

[3] **MREO Magnet rare earth oxides** can handle greater saturation magnetization than more common elements such as iron and allow for fabrication of stronger and smaller magnets. These can be used for climate economy products such as electric vehicles and wind turbines. MREOs include oxides of Nd, Pr, Dy, and Tb and are some of the highest value REEs.

[4] For more information on the Serra Verde operation, please refer to the company website: https://serraverde.com/en/our-operation/

[5] For details of the Serra Verde Mineral Resource Estimate, please refer to Serra Verde presentation: https://www.cetem.gov.br/antigo/images/palestras/2015/iiisbtr/05-denilson-fonseca.pdf

Forward Looking Statements

Statements regarding plans with respect to Alvo's Palma Project and its exploration program are forward-looking statements. Forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions which are outside Alvo's control and actual values, results or events may be materially different to those expressed or implied herein. Alvo does not undertake any obligation, except where expressly required to do so by law, to update or revise any information or any forward-looking statement to reflect any changes in events, conditions, or circumstances on which any such forward-looking statement is based.

Competent Person's Statement

The information contained in this announcement that relates to recent exploration results is based upon information compiled by Mr Rob Smakman of Alvo Minerals Limited, a Competent Person and Fellow of the Australasian Institute of Mining and Metallurgy. Mr Smakman is a full-time employee of Alvo and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the "Australasian Code for Reporting of Mineral Resources and Ore Reserves" (or JORC 2012). Mr Smakman consents to the inclusion in this announcement of the matters based upon the information in the form and context in which it appears.

The information in this release that relates to metallurgical testwork is based on information compiled and / or reviewed by Mr Gavin Beer who is a Member and Chartered Professional of The Australasian Institute of AusIMM. Mr Beer is a consulting metallurgist with sufficient experience relevant to the activity which he is undertaking to be recognised as competent to compile and report such information. Mr Beer consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. Mr Beer does not hold securities in Alvo

ABOUT ALVO

Alvo Minerals (ASX: ALV) is an active critical minerals exploration company, with two exciting Projects being explored from the Company's base in Central Brazil.

Alvo is hunting high-grade copper and zinc at its Palma Copper-Zinc VMS Project. The Palma Project has a JORC 2012 Inferred Mineral Resource Estimate (MRE) of 4.6Mt @ 1.0% Cu, 3.9% Zn, 0.4% Pb & 20g/t Ag. MRE to be updated in 2023.

Alvo is also exploring for Rare Earth Elements, currently undertaking due diligence on the highly prospective Bluebush MREE Project, adjacent to its existing exploration base. Bluebush is adjacent to and along strike from the Serra Verde Ionic Clay REE Project, which is the only Ionic Clay REE project currently in construction outside of China.

Alvo's strategic intent is to aggressively explore and deliver growth through discovery, leveraging managements' extensive track record in Brazil.

Alvo is committed to fostering best in class stakeholder relations and supporting the local communities in which it operates.

Table 2: *Collar file of Alvo Auger drilling at Bluebush from where the metallurgical samples were selected*

HOLE_ID	EASTING	NORTHING	RL	EOH	AZIMUTH	DIP	PROJECT	PROSPECT
BLG0009	772,322	8,548,323	755	**10.0**	0	-90	BLUEBUSH	BOA VISTA
BLG0014	772,282	8,548,916	760	**11.0**	0	-90	BLUEBUSH	BOA VISTA
BLG0034	771,963	8,547,126	831	**21.4**	0	-90	BLUEBUSH	BOA VISTA
BLG0068	767,109	8,551,980	435	**10.0**	0	-90	BLUEBUSH	SAO BENTO
BLG0134	766,462	8,551,069	421	**4.8**	0	-90	BLUEBUSH	SAO BENTO

Appendix 1 JORC Tables

Section 1 Sampling Techniques and Data (Criteria in this section apply to all succeeding sections, note data in this section is extracted from historic reports)

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 Nickel that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• Alvo auger drilling: Auger geochemical sampling was completed on 1 or 2 metres continuous samples. The samples are homogenised on a tarp and a representative sample of approximately 1kg is bagged and labelled. Sample information is collected in the field on a tablet. • The samples are dispatched to the independent external lab- SGS Geosol in Goiania, where preliminary prep is completed before being dispatched to SGS in Belo Horizonte for analysis • Sampling was supervised by Alvo Minerals field technicians who described the material of each sample as soil, saprolite or weathered rock.
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).*	• Auger drilling was completed using a hydraulic auger drilling machine with a 4.5" auger bit and 2m helicoidal rods. The drilling is open hole, meaning there is a significant chance of contamination from the surface and other parts of the auger hole. Holes are vertical and not oriented.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and 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.*	• No recoveries are recorded. • The operator observes the volume of each metre and notes any discrepancy. • No relationship is believed to exist between recovery and grade.

Criteria	JORC Code explanation	Commentary
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 in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• All holes were logged by Alvo Minerals geologists or field technicians, detailing the colour, weathering, alteration, texture and any geological observations. Care is taken to identify transported cover from in-situ saprolite/clay zones and the moisture content. • Qualitative logging only, each hole is photographed along with the samples arrayed in drill order. • All auger drilling is logged onsite by Alvo field technicians. Logs include hole number, hole location, date drilled, collar location, dip and azimuth as well as qualitative data such as rock type, and descriptions of the colour, alteration, weathering, grain size, mineralisation and texture.
Sub-sampling techniques and sample preparation	• *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.* • *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.*	• All the sampling procedures were conducted by the Alvo Minerals geologists and technicians. • Auger sampling is completed on site. Samples are collected from a modified bucket around the mouth of the hole and then each sample is homogenised and quartered, with a sample bagged on site and sent to the independent lab (SGS Geosol). • Sampling is considered to be appropriate for the material being collected.
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 laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• The samples were dispatched to SGS in Goiania, where the physical preparation was done. Analysis was completed at the SGS Geosol laboratory in Vespasiano (Belo Horizonte) – Minas Gerais state, Brazil. • The SGS Geosol lab sample preparation includes drying, crushing with P75 of 3mm, homogenised, quartered and pulverized of 300g with P95 below 150#. • The SGS Geosol analytical procedures (ICP95A/IMS95A) include lithium metaborate fusion assays by ICP OES/MS , according to standard industry practices. The elements analysed were: Al_2O_3, Ba, CaO, Cr_2O_3, Fe_2O_3, K2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, Sr, TiO_2, V, Zn, Zr, Ce, Co, Cs, Cu, Dy, Er, Eu, Ga, Gd, Hf, Ho, La, Lu, Mo, Nb, Nd, Ni, Pr, Rb, Sm, Sn, Ta, Tb, Th, Tl, Tm, U, W, Y, Yb. Also, Loss on Ignition (LOI) was determined by calcining the sample at 1000°C. • The Leaching test method ICM694 includes Ammonium Sulfate Leaching followed by ICPOES/ICPMS analysis. The sample was subjected to leaching at room temperature with 160 ml of a 0.5 mol/L ammonium sulfate solution for 30 minutes. Post-leaching, the pulp was filtered using a vacuum pump, and the residue was rinsed with 80 ml of a 0.1% ammonium sulfate solution. An aliquot of the solution was then taken and diluted 25 times with 2% HNO3. • The diluted solution from the above process was analysed using the method ICPOES / ICPMS . The assays include: Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Hg, Ho, In, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Nd, Ni, P, Pb, Pr, Rb, Re, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr. • Quality Control: The laboratory follows strict quality control procedures, ensuring the accuracy and precision of the assay data. Internally, the laboratory uses replicate assays, standards, and blanks to maintain quality.

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>• No sample duplicates. The Standards and Blanks showed acceptable values.</td></tr>
<tr><td>Verification of sampling and assaying</td><td>• 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.</td><td>• Significant intercept tables are prepared by Alvo personal and checked by at least one other Company geologist.
• No twinned holes are being reported.
• All data was received from Mata Azul in an Access database and checked against lab files (excel and PDF).
• Adjustments to the data were made- transforming the elemental values into the oxide values. The conversion factors used are included in the table below. Only intervals of saprolite Weighted averages were used to calculate significant intercepts.
<table>
<tr><th>Element</th><th>Oxide</th><th>Factor</th></tr>
<tr><td>Sc</td><td>Sc2O3</td><td>1.5338</td></tr>
<tr><td>Ce</td><td>CeO2</td><td>1.1713</td></tr>
<tr><td>La</td><td>La2O3</td><td>1.1728</td></tr>
<tr><td>Sm</td><td>Sm2O3</td><td>1.1596</td></tr>
<tr><td>Nd</td><td>Nd2O3</td><td>1.1664</td></tr>
<tr><td>Pr</td><td>Pr6O11</td><td>1.2082</td></tr>
<tr><td>Dy</td><td>Dy2O3</td><td>1.1477</td></tr>
<tr><td>Eu</td><td>Eu2O3</td><td>1.1579</td></tr>
<tr><td>Y</td><td>Y2O3</td><td>1.2699</td></tr>
<tr><td>Tb</td><td>Tb4O7</td><td>1.1762</td></tr>
<tr><td>Gd</td><td>Gd2O3</td><td>1.1526</td></tr>
<tr><td>Ho</td><td>Ho2O3</td><td>1.1455</td></tr>
<tr><td>Er</td><td>Er2O3</td><td>1.1435</td></tr>
<tr><td>Tm</td><td>Tm2O3</td><td>1.1421</td></tr>
<tr><td>Yb</td><td>Yb2O3</td><td>1.1387</td></tr>
<tr><td>Lu</td><td>Lu2O3</td><td>1.1371</td></tr>
</table></td></tr>
<tr><td>Location of data points</td><td>• 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.</td><td>• A GPS are used to locate and records the auger drill collars. No auger drill holes are downhole surveyed.
• All location data has been recorded SAD69 (South America 1969 Datum) UTM zone 22S.
• Topographic control is adequate for the stage of exploration at Bluebush.</td></tr>
<tr><td>Data spacing and distribution</td><td>• 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.</td><td>• Auger drillholes are variably spaced utilising existing roads as access.
• The results reported may be considered in an MRE.
• No compositing has been applied to the results- apart from weighted averages</td></tr>
<tr><td>Orientation of data in relation to geological structure</td><td>• 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</td><td>• Drilling is shallow and considered as a first pass sampling - generally lines are oriented across the assumed geological terrain. No bias is believed to have occurred. Sampling lengths were generally 0.5-2m downhole, unless there was a specific geological control required by the technician.
• No relationship between mineralisation and drilling orientation is known at this stage.</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
	should be assessed and reported if material.	
Sample security	• *The measures taken to ensure sample security.*	• The auger samples were collected and split in the field and the remaining material was discarded. The quarter was sent to the SGS Geosol, the pulps returned for storage in Palmeiropolis -TO.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No audit to date.

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.*	• The prospects described in the report are all located in Brazil on tenements owned by Mineracao Mata Azul S/A, over which Perth Minerals (Alvo's 100% owned Brazilian Subsidiary) has signed a binding purchase option for up to 100% of the shares in Mata Azul S/A. Processo | Titular | Área | Fase do processo 864.251/2004 | Mineração Mata Azul S A | 1827,85 | Autorização de Pesquisa 864.381/2011 | Mineração Mata Azul S A | 1456,99 | Autorização de Pesquisa 864.170/2007 | Mineração Mata Azul S A | 1070,8 | Autorização de Pesquisa 864.059/2012 | Mineração Mata Azul S A | 787,88 | Autorização de Pesquisa 860.066/2009 | Mineração Mata Azul S A | 1796,62 | Autorização de Pesquisa 860.067/2009 | Mineração Mata Azul S A | 1875,6 | Autorização de Pesquisa 864.056/2010 | Mineração Mata Azul S A | 95,64 | Autorização de Pesquisa 864.612/2008 | Mineração Mata Azul S A | 3122,48 | Autorização de Pesquisa TOTAL | 12033,86 | • Alvo has reviewed the publicly available information on the government websites and is comfortable the tenements are in good standing. Additional work will be completed during the due diligence period to verify the veracity of the tenement status and ownership.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Exploration was mainly completed by Mata Azul S/A (Project vendors). The work was completed to a high standard for the time and included auger drilling, pitting, trenching and channel sampling. Much of the focus of the historical exploration was completed looking for alluvial and colluvial deposits of REE minerals. • Some work was completed by GE21, an independent exploration services company based in Brazil. This work included pitting and auger drilling, comparing against the earlier work of Mata Azul. The work overall appeared to replicate the older work and focussed more on the alluvial potential of the Project. • Airborne geophysics. There have been several combined aeromagnetic and radiometric surveys which cover the area, generally flown by Brazilian Government Agencies. These are generally broad spaced and useful for regional context. Maps of radiometrics and magnetics flown by a third party- believed to be Mining Ventures Brazil, covered the area, although the source information is not available.

Criteria	JORC Code explanation	Commentary
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The REE occurrences at Bluebush are located on the Serra Dourada Granite (GSD), which is part of the Goiás Staniferous Province. The GSD is an oval and elongated batholith approximately 55km long in the N-S direction by 12km wide. In the intrusion, there have been various phases of post-magmatic alteration identified that generated albitites and greisens mineralized in Sn (Ta-Nb-W), pegmatites mineralized in Be and tourmaline. These granites are generally enriched in U, Th, Nb, F, Li, Ga, Zn and REE including Y with progressive enrichment of the HREE in relation to the LREE in the most metasomatized phases. • Alvo is targeting the saprolite horizon above the granite where enrichment and transformation into ionic adsorption clay REE's may have occurred. Alvo believes the Bluebush project may have the same properties as the Serra Verde Project located 40km to the south.
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.*	• See Collar table in report.
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.*	• The significant intercepts were calculated using values > 750ppm TREO only in consecutive intervals of saprolite or soil samples originally sampled meter by meter. No upper cuts were considered. • To calculate the Total Rare Earth Oxide (TREO) values, the values of CeO2, La2O3, Sm2O3, Nd2O3, Pr6O11, Dy2O3, Eu2O3, Tb4O7, Gd2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3, Lu2O3 and Y2O3 were summed. • To calculate the Magnet Rare Earth Oxide (MREO) values, the values of, Nd2O3, Pr6O11, Dy2O3 and Tb4O7 were summed. • Weighted averages were calculated for all intercepts.
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').*	• Mineralisation orientation is not known at this stage, although assumed to be generally flat lying. • The downhole depths are reported, true widths are not known at this stage.

Criteria	JORC Code explanation	Commentary
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.*	• See diagrams reported in the announcement
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 results are reported above the cut-offs described above.
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.*	• Historical work has been reported previously by Alvo, where work completed generally did not target the clay horizon, more alluvial accumulations of the minerals hosting primary REE's. • No other data is considered relevant at this time.
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.*	• Alvo intends to sample the auger drilling and in areas of high prospectivity, samples will also be tested for their ionic clay potential. • Alvo will conduct soil sampling across the project, once an orientation program is complete- especially in areas of difficult access. A handheld auger has also been purchased and will be utilised to test saprolite horizons in areas of difficult access. • Alvo has recently purchased a Loupe Geophysical mobile electromagnetic equipment, which should be able to map the depth of the saprolite to the granite (soon to be imported). • Alvo has in-house electromagnetic and Induced polarisation survey equipment and is performing FLEM, DHEM and IP surveys in the region. These techniques or others may be utilised during the due diligence period and beyond. • Alvo will geologically map and occasionally dig trenches/pits to better understand the under-surface geology and geochemistry.