ASX ANNOUNCEMENT
Heavy Rare Earths Limited (ASX: HRE)
23 October 2023

SIZEABLE EXPLORATION TARGET AT COWALINYA

- Conservative Exploration Target estimated for Cowalinya: **280 to 1390 million tonnes @ 330 to 1330 ppm TREO**
- Exploration Target **excludes recently announced Mineral Resources of 159 million tonnes @ 870 ppm TREO**
- Collectively, Mineral Resources and Exploration Target **occupy 45% of HRE's total land position** at Cowalinya
- Scale of rare earths inventory at Cowalinya indicates **potential to underpin a long-life development**
- Opportunities for straightforward conversion of Exploration Target to additional Mineral Resources via modest programs of shallow drilling

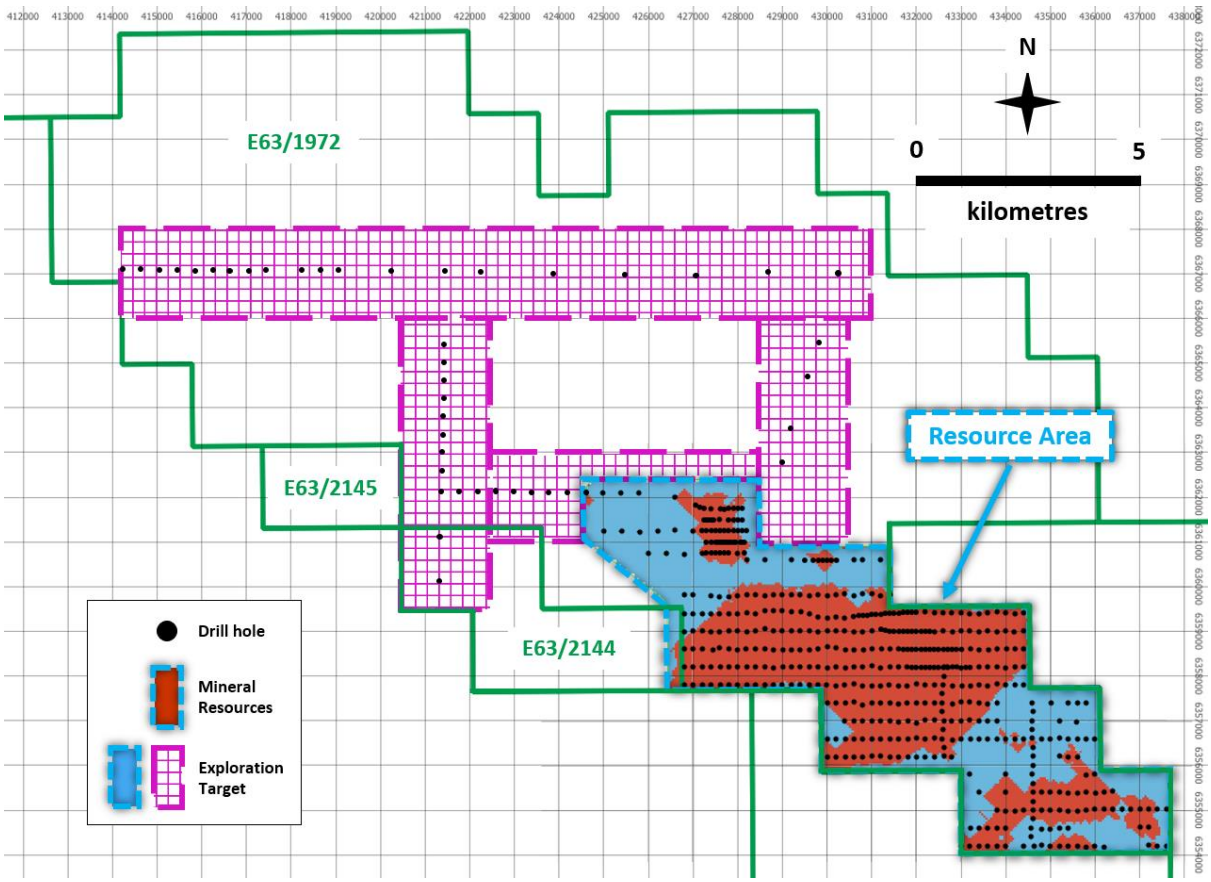

Figure 1: Cowalinya Mineral Resources and Exploration Target.

Heavy Rare Earths Limited (**"HRE"** or **"the Company"**) is pleased to report a sizeable Exploration Target at its 100 per cent-owned Cowalinya rare earth project in the Norseman-Esperance region of Western Australia.

The Exploration Target is summarised in Table 1 below and shown in Figure 1. Most of the Exploration Target lies immediately to the north-west of the project's **Inferred Mineral Resources which are estimated to be 159 million tonnes @ 870 ppm TREO** using a 400 ppm TREO-CeO_2 grade cut-off *(refer to ASX announcement 3 October 2023)*. The potential quantity and grade of the Exploration Target is conceptual in nature, and there has been insufficient exploration completed by HRE on parts of its Cowalinya tenement package to estimate Mineral Resources. Furthermore, it is uncertain if further exploration will result in defining additional Mineral Resources at Cowalinya.

Table 1: Exploration Target for Cowalinya Rare Earth Project.

JORC CLASS	TONNES (Mt)	TREO (ppm)	AVERAGE TREO (ppm)	AVERAGE MAGNET REOs (ppm)	AVERAGE MAGNET REOs/TREO
Exploration Target	**280-1390**	**330-1330**	**570**	**150**	**26%**

TREO = La_2O_3+CeO_2+Pr_6O_{11}+Nd_2O_3+Sm_2O_3+Eu_2O_3+Gd_2O_3+Tb_4O_7+Dy_2O_3+Ho_2O_3+Er_2O_3+Tm_2O_3+Yb_2O_3+Lu_2O_3+Y_2O_3
Magnet REOs = Pr_6O_{11}+Nd_2O_3+Tb_4O_7+Dy_2O_3

HRE Executive Director, Richard Brescianini, said, *"Taken together with our recently announced 159 million tonnes of Inferred Resources, today's result of up to 1.4 billion tonnes in an Exploration Target at Cowalinya delivers a clear statement on the potential of our land holdings to host sufficient rare earths to underpin a long-life development. Of course, further drilling is necessary to convert any part of the Exploration Target to Mineral Resources, but its execution must not run ahead of one of our key downstream metallurgical work programs, the production and customer qualification of a mixed rare earth carbonate product, scheduled for completion by the end of this year."*

Figure 1 shows the area of HRE's existing Inferred Resources (red) in the densely-drilled south-east corner of E63/1972. New Exploration Target areas are 1) in the immediately adjacent less densely drilled areas (blue) within the Resource Area (dashed blue border) and 2) further to the north-west within the four pink hatched areas containing single lines of 'far field' aircore drill holes (black dots). REE-mineralised intercepts in all holes along the lines clearly demonstrate continuity of the mineralised layers found to the south-east in the Resource Area.

The Exploration Target of **280-1390 Mt @ 330-1330 ppm TREO** presents HRE with some relatively straightforward upgrade opportunities to Mineral Resources at Cowalinya:

1. Inside the project's Resource Area, an Exploration Target of **40-80 Mt @ 650-1330 ppm TREO** (average 990 ppm TREO) has been estimated. A limited program of shallow aircore drilling is being designed to capture this upgrade opportunity.
2. Within the 'far field' Exploration Target areas, a small number of limited-length parallel lines of shallow aircore drilling targeting the best contiguous zones of rare earth intercepts (*e.g.,* **7 m @ 1303 ppm TREO from 7 m in AC473; 10 m @ 1286 ppm TREO from 16 m in AC471; 30 metres @ 923 ppm TREO from 11 m in AC468**; *refer to ASX announcement 1 May 2023*) is planned.

Encouraged by the successful use of historic airborne electromagnetic (AEM) data to help guide HRE's resource exploration and expansion drilling in 2022 over part of the Resource Area, the Company is now considering employing AEM (*e.g.,* SkyTEM) to map the extent of clay-rich saprolite horizons to prioritise drill traverses within the 'far field' Exploration Target areas, on adjacent parts of E63/1972, and on E63/2144 and E63/2145.

The following information is reproduced from a report entitled *Cowalinya –2023 JORC REE Mineral Resources and Exploration Target Summary*, dated 20 October 2023. The report's author is Mr Robin Rankin (MAusIMM), Principal Consulting Geologist at GeoRes. Mr Rankin is referred to as "the Consultant" in the below and is the Competent Person for the earlier reported Cowalinya Mineral Resources and this Exploration Target.

Target area design: Design of the areas for Exploration Targets was firmly based on existing drilling data and its spacing – and aimed to maximise continuity by only selecting contiguous areas enclosing holes <1,500 m apart (a distance approximately 2* the maximum data range of ~800 m). The remainder of the Resource Area not occupied by Inferred Resources (1) was considered an area clearly meeting the hole spacing criteria (<1,500 m) to constitute an Exploration Target area (the great proportion of holes in the area were spaced <600 m apart with the remainder <1,000 m apart). Only its current patches of wider-spaced and more irregular drilling prevented it all being considered for Inferred Resources. In terms of (2) the 4 isolated drill hole lines to the NW of the Resource Area, the hole-spacing along them was in groupings of 400m, 1,000 m or 1,500 m – meeting the criteria and close enough to reliably interpret geological continuity between them.

Target in Resource Area (1): Exploration Target material reported from within the Resource Area was from blocks not already classified as Inferred Resources (*i.e.,* where block grade estimation sample distances were >450 m) and above a 400 ppm TREO-CeO_2 grade cut-off (as for the Inferred Resources).

The Resource Area in Figure 2 (for the lower SLM layer) bounds blocks shade-coloured on the grade estimation sample distances (D) used to classify Mineral Resources. Blocks with D<450 m (red and orange) were classified as Inferred. Blocks with D>450 m (yellow, purple and white) were Exploration Target areas.

Target tonnage ranges were derived from 30% variation about the average 60 Mt. Target grade ranges were derived from one standard deviation (SD) about the average grade (TREO: average 990 ppm, SD 680 ppm; MREO: average 270 ppm, SD 230 ppm).

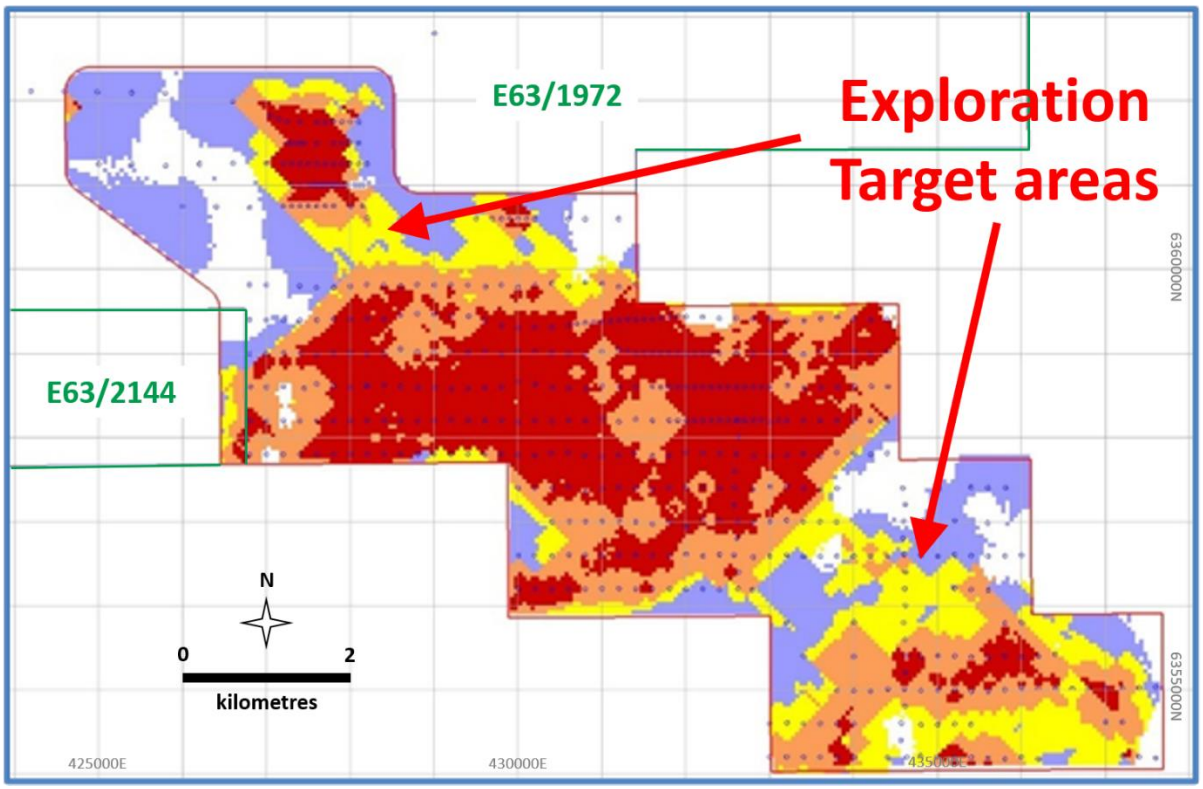

Figure 2: Cowalinya Resource Area showing block grade estimation sample distances defining Mineral Resources (<450 metres; red and orange) and Exploration Target (>450 metres; yellow, purple and white) for the lower SLM layer.

Target along isolated drill hole lines (2): Exploration Targets were reported for areas along each of 4 isolated lines of single HRE drill holes within the tenements to the NW of the Resource Area (lines labelled in Figure 3 below). The maximum extent (2 km wide) of those areas is shaded pink. Also shown are HRE's tenements (purple boundaries), drill hole collars (black circles) and the Resource Area (green boundary where not covered by purple tenement boundary).

Drill holes (black dots) along the 4 lines were considered close enough (maximum 1,600 m, mostly 400 m) to reliably support geological interpretation from hole to hole. All REE-mineralised layers interpreted for the Inferred Resources had also been interpreted and modelled in all of these holes (effectively at a >300 ppm TREO lower grade cut-off). That showed the full continuity of this Target area with the Resource Area to the SE.

The large 8 km E/W and 5 km N/S distance between the 4 lines was considered too great to reliably interpolate across – hence the internal 6*3 km rectangular area in the middle of E63/1972 excluded from the Target area.

Several lines of historic AngloGold-Ashanti AC drill holes (red dots) were situated close to the SW boundary of HRE's tenements and within HRE's E63/2144. As they continued the geology and mineralisation southward from HRE's holes on N/S line 421,500E that line was extended to the southern boundary of E63/2144. E/W line 6,362,000 N and N/S line 429,500 E abutted the NW end of the Resource Area to maintain continuity between the Resource Area and the lines.

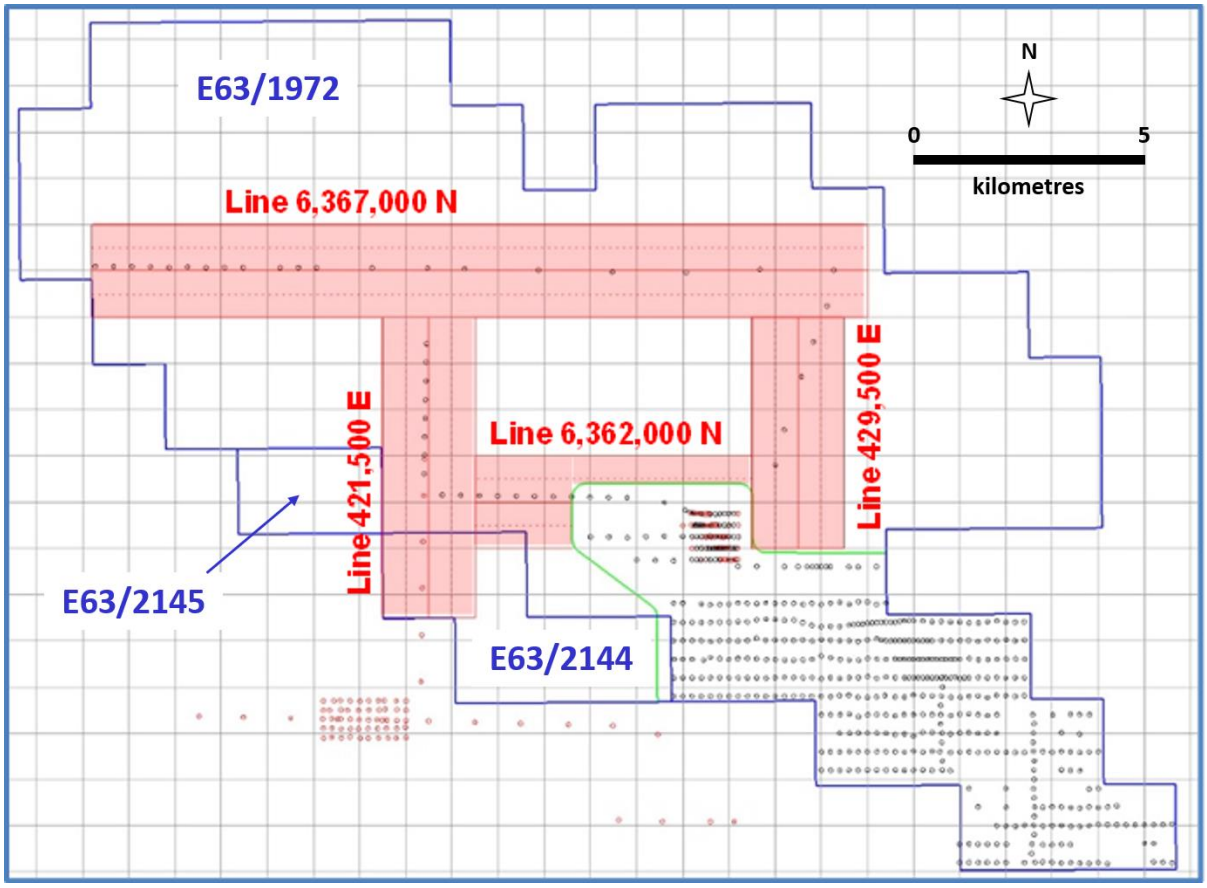

Figure 3: Cowalinya 'far field' Exploration Target areas along isolated drill lines.

Tonnages of drill hole lines: Target tonnage ranges were derived from variations in the volumes along the drill hole lines from application of different line widths and layer thicknesses. Volumetric dimensions of the drill hole lines are given in Table 2 below. Lengths of the individual lines varied from ~5 km up to ~17 km. Drill lines were given areas by assigned fixed strip widths – either minimum 1,000 m wide or maximum 2,000 m wide (maximum width area shaded pink in Figure 3). Total area of the lines was a minimum of 3,000 ha (30 km^2) or a maximum of 6,300 ha (63 km^2). To arrive at volumes the individual drill lines were given minimum 5 m and maximum 15 m thicknesses – based on the interpretation of the REE-mineralised layer intercepts in the line holes.

Table 2: Drill hole line volumetric dimensions.

Area / Line	Line end coordinates		Length	Width		Area		Thickness		Volume		Dens.	Tonnes	
	(m)	(m)	(m)	Min (m)	Max (m)	Min (ha)	Max (ha)	Min (m)	Max (m)	Min (Mm3)	Max (Mm3)	(t/m3)	Min (Mt)	Max (Mt)
N/S line 421,500E	6,359,500 N	6,366,000 N	6,500	1,000	2,000	650	1,300	5	12	33	156	1.51	50	240
N/S line 429,500E	6,361,000 N	6,366,000 N	5,000	1,000	2,000	500	1,000	5	12	25	120	1.51	40	180
E/W line 6,362,000N	422,500 E	424,600 E	2,100	1,000	2,000	210	420	5	15	11	63	1.51	20	100
	424,600 E	428,500 E	3,900		500		195	5	10		20	1.51		30
E/W line 6,367,000N	414,200 E	431,000 E	16,800	1,000	2,000	1,680	3,360	5	15	84	504	1.51	130	760
ISOLATED DRILL HOLE LINES [B]						**3,000**	**6,300**					**1.51**	**240**	**1,310**

Grades of drill hole lines: TREO and MREO grades were derived directly from statistics of the interpreted REE-mineralised layers in the 42 holes along the 4 drill lines. Target grade ranges were derived for each layer from one standard deviation (SD) about the average grade, with values given in Table 3. Totals for layers SMM and SLM were sample length-weighted (with upper layer SUM ignored).

Table 3: Drill hole line grade statistics.

Element	Layer / domain	Drill holes	Samples number	Length (m)	Av (μ) (ppm)	SD (σ) (ppm)	Av - (SD/2) Min (ppm)	Av + (SD/2) Max (ppm)
TREO	SUM / 2	42	69	138	240	150	170	310
	SMM / 3	42	125	244	520	440	300	740
	SLM / 4	42	156	300	560	410	350	770
	SMM+SLM			Length-weighted	**540**		**330**	**760**
MREO	SUM / 2	42	69	138	50	40	30	70
	SMM / 3	42	125	244	130	160	50	210
	SLM / 4	42	156	300	140	130	80	200
	SMM+SLM			Length-weighted	**140**		**70**	**200**

REO Exploration Target: Table 4 lists the Targets by area, and figures are rounded. A total REO Exploration Target was reported of 280 to 1,390 Mt @ 330 to 1,330 ppm total REO, 26% of which consisted of magnet REOs. Tonnage was calculated using an average density of 1.51 t/m^3.

Table 4: Exploration Target (by area) for Cowalinya Rare Earth Project.

Cowalinya 2023 Rare Earth Oxide (REO) Exploration Target 16/10/2022 REOs in weathered saprolitic regolith. Average density 1.51 t/m3.										
Area / Line	Dens.	Tonnes		TREO[1]			MREO[4]			
	(t/m3)	Min (Mt)	Max (Mt)	Min (ppm)	Max (ppm)	Av (ppm)	Min (ppm)	Max (ppm)	Av (ppm)	Av MREO / TREO
RESOURCE AREA [A]	~1.51	40	80	650	1,330	990	160	380	270	27%
ISOLATED DRILL HOLE LINES [B]	1.51	240	1,310	330	760	540	70	200	140	26%
TOTAL [A+B]	**~1.51**	**280**	**1,390**	**330**	**1,330**	**570**	**70**	**380**	**150**	**26%**

[A] Blocks in Resource Area outside Inferred Resources (where D>450 m). At >400 ppm TREO-CeO_2 cut-off.
[B] Isolated drill hole lines NW of Resource Area. Area either side of lines: minimum 500 m, maximum 1,000 m. Layer thickness: 5 m to 15m.
Hole spacing along lines from 400 m to 2,000 m. Drill hole layer intercepts >300 ppm TREO.
[1] Total REO (TREO) = REOs + Yttrium oxide = (La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3 + Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3 + Lu_2O_3) + Y_2O_3)
[4] Total magnet REO (MREO) = (Pr_6O_{11} + Nd_2O_3 + Tb_4O_7 + Dy_2O_3)

Conclusion: The Consultant considers this REE Exploration Target to be a highly realistic, and conservative, estimate of the REE exploration potential of at least the whole central part of HRE's large tenement E63/1972, at least the whole of HRE's smaller tenement E63/2144 and in all likelihood HRE's tenement E63/2145. The principal reason behind this opinion is the clear continuity of the Inferred Resources REE-mineralised layers in the SE part of E63/1972 towards these Exploration Target areas to the NW (both in westerly and northerly directions). This was the case with all holes in the Exploration Target areas. But for the absence of (even one) parallel drill lines (at say 600 m spacing) away from these isolated single lines, and minimal in-fill drilling within gaps in the Resource Area, this Exploration Target would convert directly to Mineral Resources.

-- Ends --

This announcement has been approved by the Board of HRE.

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About Heavy Rare Earths Limited
Heavy Rare Earths Limited (ASX:HRE) is an Australian rare earth exploration and development company. HRE's key exploration project is Cowalinya, near Esperance in Western Australia. This is a clay-hosted rare earth project with a JORC Inferred Resource of 159 Mt @ 870 ppm TREO and a desirable rare earth composition where 28% are the valuable magnet rare earths and 23% the strategic heavy rare earths.

Competent Persons Statement
Exploration Target

Statement: The information in this report, that relates to Exploration Results and Exploration Targets, is based on REE exploration information and data that was compiled and supplied by Heavy Rare Earths Limited (HRE) (see secondary Competent Person Statement below) which was reviewed and used for resource estimation by Mr Robin Rankin, a Competent Person who is a Member (#110551) of the Australasian Institute of Mining and Metallurgy (MAusIMM) and accredited since 2000 as a Chartered Professional by the AusIMM in the Geology discipline. Mr Rankin provided this information to HRE as paid consulting work in his capacity as Principal Consulting Geologist and operator of independent geological consultancy GeoRes. He and GeoRes are professionally and financially independent in the general sense and specifically of HRE and of the HRE's Cowalinya Project. This consulting was provided on a paid basis, governed by a scope of work and a fee and expenses schedule, and the results and conclusions reported were not contingent on payments. Mr Rankin has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being 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' (the JORC Code). Mr Rankin consents to the inclusion in HRE's announcement of the matters based on this information in the form and context in which it appears. Mr Rankin's Competent Persons Statement is given on the basis that HRE takes responsibility to a Competent Persons level for the collection and integrity of source input data supplied by HRE.

Source data: All source data (whether supplied by HRE or derived elsewhere) was originally taken at face value by the Mr Rankin. Mr Rankin performed validation of the data to the extent considered possible and to his satisfaction. He believes that validation to at least be to the level required for JORC Resource estimation and reporting. Mr Rankin could not validate 'historical data' to the same degree as recent data.

Exploration Results

Statement: The REE exploration information in this report that relates to Exploration Results, Exploration Data, Sampling Techniques or Geochemical Assay Methodology is based on information compiled by Mr Richard Brescianini who is a Member of the Australian Institute of Geoscientists. Mr Brescianini is an Executive Director, shareholder and full-time employee of Heavy Rare Earths Limited (HRE). Mr Brescianini has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being 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' (the JORC Code). Mr Brescianini consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

Company information: Some information in this announcement was extracted from reports lodged as ASX announcements by HRE and is available on HRE's website https://hreltd.com.au/investors/asx-announcements/. HRE confirms that it is not aware of any new information that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. HRE confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original market announcements.

Table 5: Aircore holes used to estimate the Exploration Target outside the Cowalinya Resource Area.

HOLE NO.	NORTHING (m)	EASTING (m)	EVEVATION (m)	DIP (°)	TOTAL DEPTH (m)	DATE DRILLED
AC447	6362109	424589	255.7	-90	28	22/11/2022
AC448	6362113	424193	256.7	-90	24	22/11/2022
AC449	6362120	423790	253.1	-90	20	28/11/2022
AC450	6362126	423392	255.3	-90	24	28/11/2022
AC451	6362131	422992	252.2	-90	24	28/11/2022
AC452	6362139	422593	251.8	-90	40	28/11/2022
AC453	6362144	422192	253.5	-90	28	28/11/2022
AC454	6362149	421789	252.1	-90	22	28/11/2022
AC455	6362612	421398	254.1	-90	31	28/11/2022
AC456	6363014	421408	252.6	-90	34	24/11/2022
AC457	6363414	421413	250.7	-90	41	24/11/2022
AC458	6363814	421420	252.2	-90	49	24/11/2022
AC459	6364213	421427	253.6	-90	34	24/11/2022
AC460	6364615	421436	253.8	-90	35	24/11/2022
AC461	6365024	421442	254.7	-90	20	24/11/2022
AC462	6365425	421450	257.6	-90	18	24/11/2022
AC463	6367061	421474	270.6	-90	44	24/11/2022
AC464	6367060	420267	264.3	-90	33	25/11/2022
AC465	6367067	419071	258.3	-90	25	25/11/2022
AC466	6367065	418672	255.6	-90	9	25/11/2022
AC467	6367069	418275	254.8	-90	51	25/11/2022
AC468	6367071	417472	255.4	-90	47	25/11/2022
AC469	6367076	417074	255.2	-90	49	25/11/2022
AC470	6367069	416672	249.7	-90	44	25/11/2022
AC471	6367086	416273	249.3	-90	27	27/11/2022
AC472	6367075	415874	247.6	-90	31	27/11/2022
AC473	6367085	415466	245.2	-90	15	27/11/2022
AC474	6367093	415067	249.3	-90	22	27/11/2022
AC475	6367090	414670	248.9	-90	14	27/11/2022
AC476	6367101	414272	247.8	-90	23	27/11/2022
AC477	6367046	422274	278.4	-90	19	27/11/2022
AC478	6367017	423874	280.1	-90	30	28/11/2022

AC479	6366983	425475	268.5	-90	12	28/11/2022
AC480	6366968	427071	271.8	-90	23	28/11/2022
AC481	6367031	428671	274.5	-90	28	28/11/2022
AC482	6367018	430267	279.9	-90	19	28/11/2022
AC483	6365463	429828	276.0	-90	46	28/11/2022
AC484	6363564	429198	268.0	-90	31	29/11/2022
AC485	6362800	429001	263.2	-90	28	29/11/2022
AC531	6366238	430126	276.5	-90	31	4/12/2022
AC532	6364711	429572	270.8	-90	47	3/12/2022
SGA031*	6362930	421404	251	-90	27	15/11/2010
SGA032*	6362141	421391	258	-90	25	16/11/2010
SGA033*	6361143	421373	256	-90	50	15/11/2010
SGA034*	6360141	421358	255	-90	28	16/11/2010

** Drilled by Anglogold Ashanti*

Table 6: Mineralised saprolite intervals in drilling outside the Cowalinya Resource Area that exceed a TREO grade-thickness of 6,000 ppm-metres.

HOLE NO.	FROM (m)	TO (m)	INTERVAL (m)	TREO (ppm)	MAGNET REOs/TREO
AC452	17	35	18	691	27.7%
AC453	14	27	13	636	17.8%
AC455	14	26	12	644	30.6%
AC457	21	39	18	494	24.2%
AC458	29	48	19	693	23.8%
AC459	15	33	18	422	24.3%
AC463	16	43	27	478	21.0%
AC467	19	50	31	758	30.5%
AC468	11	41	30	923	26.7%
AC469	23	43	20	469	25.0%
AC470	16	43	27	500	27.1%
AC471	16	26	10	1286	34.4%
AC472	11	30	19	811	17.8%
AC473	7	14	7	1303	23.7%
AC476	7	22	15	452	22.1%
AC532	26	46	20	644	19.0%

TREO = La_2O_3+CeO_2+Pr_6O_{11}+Nd_2O_3+Sm_2O_3+Eu_2O_3+Gd_2O_3+Tb_4O_7+Dy_2O_3+Ho_2O_3+Er_2O_3+Tm_2O_3+Yb_2O_3+Lu_2O_3+Y_2O_3
Magnet REOs = Pr_6O_{11}+Nd_2O_3+Tb_4O_7+Dy_2O_3

2012 JORC Code – Table 1

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 (e.g., cut channels, random chips, or specific specialized 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.*	A total of 550 vertical aircore holes for 12,658 metres have been drilled by Heavy Rare Earths (HRE) on the Cowalinya project to date: 109 holes in 2021 (AC1-AC109) for 3,089 metres, and 441 holes in 2022 (AC110-AC547) for 12,569 metres. Maximum hole depth is 59 metres. All holes have been tested for supergene rare earth element (REE) mineralisation hosted by saprolitic clays. Drilling in 2021 overlapped extensively with areas previously aircore drilled by two companies exploring for gold (AngloGold Ashanti Ltd (AngloGold) and Great Southern Gold Pty Ltd). One-metre samples are collected from a cyclone into plastic bags. In HRE's 2021 drilling program, 100 holes were 4 metre composite-sampled with shorter composites at end of hole, and 9 holes were sampled on a 1 metre basis. All holes drilled by HRE in 2022 were 2 metre composite-sampled with 1 metre samples at end of hole. All mineralised intervals from drilling in 2021 were re-composited to 2 metres. In AngloGold's 2010 drilling program of 247 vertical aircore holes, 4-metre compositing of single-metre drill intervals was adopted with 1 (or 2) metre samples at end of hole. Overlying transported sediments are not routinely sampled as they do not contain anomalous amounts of REEs.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	For aircore drilling, regular air and manual cleaning of cyclone is being undertaken. Certified standards and duplicate samples are submitted with drill samples.

Criteria	JORC Code Explanation	Commentary
	Aspects of the determination of mineralisation that are Material to the Public Report.	Aircore drilling is used to obtain 1m samples which are collected in plastic bags (HRE) or laid on the ground (AngloGold). HRE: Samples ranging from 1 metre to 2 metre composites are taken for analysis. Sample size is 2-3 kilograms in weight. At LabWest Minerals Analysis (LabWest) in Perth, Western Australia, samples are dried, crushed, split and pulverized with a 0.1-gram sub-sample set aside for assay. AngloGold: Four metre composite samples weighing approximately 3 kilograms total were taken for analysis. A 750-gram composite sample of the last meter (or 2 meters if bottom of hole sample recovery was inadequate) in each hole was also taken. At Genalysis Intertek Laboratory Services (Genalysis) in Perth, Western Australia, samples were dried, milled (to a nominal size of ~75 microns) with a sub-sample set aside from assay.
Drilling techniques	*Drill type (e.g., core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g., 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.).*	The drill type is aircore, a form of reverse circulation (RC) drilling using slim rods and a 3.5-inch blade bit. The samples recovered are typically rock chips and powder, similar to RC drilling.
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Aircore recovery is visually assessed by comparing drill chip volumes in sample bags for individual metres. Estimates of sample recovery are recorded on drill logs. Routine checks for correct sample depths are undertaken. Aircore sample recoveries are visually checked for recovery, moisture and contamination and are considered to be acceptable within industry standards. The cyclone is routinely cleaned ensuring no material build up.

Criteria	JORC Code Explanation	Commentary
	Measures taken to maximize sample recovery and ensure representative nature of the samples.	Due to the generally good drilling conditions through dry saprolite the site geologist believes the samples are reasonably representative. Poor sample recovery is regularly recorded in the first couple of metres of a hole and often when hard bedrock is intersected – usually less than a full metre is recovered. Wet samples with moderate recoveries are encountered most often in the transported sand/silcrete layer lying immediately above saprolite.
	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 sample bias has been identified to date. Future studies will be undertaken.
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.*	Chip/clay samples are geologically logged in enough detail to discern lithological units. Logging is appropriate for this style of drilling and current stage of the project.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is qualitative in nature.
	The total length and percentage of the relevant intersections logged.	All aircore holes are completely geologically logged.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	Not applicable.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	HRE: One-metre samples are collected from a cyclone into plastic bags. Two-metre composites and single metre samples are collected by spearing each plastic bag with a scoop down the side of the bag and dragging it back up the side of the bag so as not to lose any sample – this achieves a representative sample from top to bottom through the entire bag. The vast majority of samples are dry sampled. AngloGold: Four metre composite samples were collected from sample piles using a scoop.

Criteria	JORC Code Explanation	Commentary
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sampling technique is appropriate for the sample types and stage of the project.
	Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.	QAQC procedures involve the use of certified standards every 20th sample (HRE) or every 35th sample (AngloGold).
	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.	A field duplicate is taken every 20th sample.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The sample size of 2-3 kilograms is considered appropriate to the grain size and style of mineralisation being investigated.
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.*	All of HRE's analyses are done at LabWest using their AF-02S technique: lithium meta/tetraborate fusion with ICP-MS/OES finish. This technique is considered to be a 'total' digest. A suite of 15 REEs – lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu), and yttrium (Y) – plus scandium (Sc), thorium (Th) and uranium (U), and oxides of aluminium (Al), calcium (Ca), iron (Fe), magnesium (Mg) and phosphorus (P), are measured. AngloGold's bottom-of-hole multi-element analyses were done at Genalysis using their B25/ETA/MS technique: aqua regia digest with ICP-MS finish. This also measured a suite of 15 REEs.
	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.	Not applicable.

Criteria	JORC Code Explanation	Commentary
	Nature of quality control procedures adopted (e.g., standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e., lack of bias) and precision have been established.	OREAS standards and/or blanks are inserted by HRE every 20th sample. Field duplicates are taken by HRE every 20th sample. LabWest uses OREAS standards, blanks and sample repeats. Acceptable levels of accuracy have been achieved. AngloGold inserted blanks at the start of all holes and standards every 35th sample.
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	Significant intersections have yet to be verified by an independent geological consultant. They have been verified by alternative company geological personnel.
	The use of twinned holes.	No twinned holes have been drilled on the project to date.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All data have been entered into Excel spreadsheets.
	Discuss any adjustment to assay data.	No data has been adjusted.
Location of data points	*Accuracy and quality of surveys used to locate drillholes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	Hole collars are surveyed using a hand-held Garmin Etrex 22x GPS with ±3 metre accuracy. Northings, eastings and elevations are recorded using the hand-held GPS.
	Specification of the grid system used.	GDA94 z51.
	Quality and adequacy of topographic control.	The Cowalinya project is located in relatively flat terrain. Topographic control is provided by Landgate's Digital Elevation Model over the region which has an expected horizontal accuracy of 10 metres and vertical accuracy of 2 metres (both 95% confidence interval).

Criteria	JORC Code Explanation	Commentary
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	In the Cowalinya Resource Area: mainly 400 metres x 200 metres. Confined areas of the Mineral Resources have been drilled at 400 metres x 100 metres, 150 metres x 100 metres and 150 metres x 50 metres. In the area of the Cowalinya project supporting the majority of the Exploration Target: 400-1600 metres.
	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.	The mineralisation occurs as extensive, generally flat lying supergene blankets hosted in saprolitic clays. Drilling and AEM data spacing is considered sufficient for this style of mineralisation to establish an Exploration Target.
	Whether sample compositing has been applied.	All HRE holes have been assayed by 2 metre composite samples, compiled from 1 metre drilled samples. Additionally, a 1 metre end-of-hole sample is submitted for a 63 multi-element assay. A total of 7,340 samples (including standards, blanks and field duplicates) have been submitted for assay. All AngloGold holes were assayed by 4-metre composite samples, compiled from 1 metre drilled samples. A bottom-of-hole metre sample was submitted for a 58 multi-element assay.
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.*	Sampling is likely to be unbiased as vertical holes are intersecting flat lying mineralisation.
	If the relationship between the drilling orientation and the orientation of key mineralized structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	It is unlikely to be biased.
Sample security	*The measures taken to ensure sample security.*	Experienced field assistants have undertaken the sampling and delivery of samples to the freight company in Esperance, which provides a direct delivery service to LabWest in Perth.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	No audits or reviews have been commissioned to date.

Section 2: Reporting of Exploration Results

(Criteria listed in the preceding Section 1 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.*	Heavy Rare Earths Limited's (HRE's) Cowalinya project, located 55 kilometres east-north-east of Salmon Gums in Western Australia, comprises exploration licences E63/1972, E63/2144 and E63/2145. Collectively they occupy 87 graticular blocks, equivalent to an area of 252 km^2. The project is wholly situated on unallocated crown land. The registered holder of all the tenements is HRE. Full native title rights have been granted over E63/1972, E63/2145 and the northern part of E63/2144, and on adjacent lands to the north, to the Ngadju people. Full native title rights have been granted over the southern part of E63/2144, and on adjacent lands to the south, to the Esperance Nyungar people. Cultural heritage surveys are undertaken in close consultation with the relevant native title group in advance of substantial disturbance exploration works.
	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.	All tenements are in good standing. There are no impediments to operating on the tenements other than requirements of the DMIRS and the relevant Cultural Heritage Protection Agreement, all of which are industry standard.

Criteria	JORC Code Explanation	Commentary
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	AngloGold Ashanti Ltd (AngloGold) and Great Southern Gold Pty Ltd (GSG) previously worked in the Cowalinya project area exploring for gold mineralisation. Surface geochemical sampling and aircore drilling was undertaken by both companies but no significant gold mineralisation was discovered. Both companies assayed bottom of hole samples for a suite of multi-elements including REEs. Anomalous bedrock REE values were recorded in numerous holes from their drilling including in 4 holes drilled by AngloGold along N/S line 421,500E on E63/1972 and E63/2144. GSG also assayed for La and Ce for the entire length of a number of holes. AngloGold flew an airborne magnetic/radiometric survey to assist with mapping of buried bedrock lithologies. Buxton Resources and Toro Energy also previously worked in the Cowalinya project area exploring for gold and nickel mineralisation, and uranium mineralisation, respectively. Both companies flew time-domain electromagnetic surveys to aid in their exploration targeting.
Geology	*Deposit type, geological setting and style of mineralisation.*	The deposit type being investigated is low grade saprolite clay-hosted supergene rare earth mineralisation. This style of supergene rare earth mineralisation is developed over bedrock granitic rock types (granites and granitic gneisses) which contain anomalous levels of REEs. Although low grade, low mining and processing costs can make this type of deposit profitable to exploit.
Drillhole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:* - *easting and northing of the drillhole collar* - *elevation or RL (Reduced Level – elevation above sea level in metres) of the drillhole collar* - *dip and azimuth of the hole* - *down hole length and interception depth* - *hole length.*	All relevant data for the drilling is shown in Table 5 (including AngloGold's 4 holes).

Criteria	JORC Code Explanation	Commentary
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g., cutting of high grades) and cut-off grades are usually Material and should be stated.*	All REE assays have been converted to oxide (REO) values using the following industry standard element-to-stoichiometric oxide conversion factors: La_2O_3 = La x 1.1728 CeO_2 = Ce x 1.2284 Pr_6O_{11} = Pr x 1.2082 Nd_2O_3 = Nd x 1.1664 Sm_2O_3 = Sm x 1.1596 Eu_2O_3 = Eu x 1.1579 Gd_2O_3 = Gd x 1.1526 Tb_4O_7 = Tb x 1.1762 Dy_2O_3 = Dy x 1.1477 Ho_2O_3 = Ho x 1.1455 Er_2O_3 = Er x 1.1435 Tm_2O_3 = Tm x 1.1421 Yb_2O_3 = Yb x 1.1387 Lu_2O_3 = Lu x 1.1371 Y_2O_3 = Y x 1.2699. These oxide values are summed to produce a total rare earth oxide (TREO) grade for each assay sample. Minimum grade cut-off used is 300 ppm TREO. Maximum internal dilution is 2 metres @ <300 ppm TREO. No high cut-off has been applied. Length weighted averages have been applied to intersections.
	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.	Intervals reporting >1,000 ppm TREO are reported separately.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used.

Criteria	JORC Code Explanation	Commentary
Relationship between mineralisation widths and intercept lengths	*If the geometry of the mineralisation with respect to the drillhole 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 (e.g., 'down hole length, true width not known').*	To date the targeted mineralisation appears to occur in flat lying sheets and drill holes have all been drilled at 90° vertically. The down hole length of intercept is effectively a true thickness of mineralisation.
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 drillhole collar locations and appropriate sectional views.*	Refer to Figures 1-3 for plan views showing drillhole collar locations.
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.*	Summary assays for all mineralised intervals above a TREO grade-thickness of 6,000 ppm-metres are presented in Table 6.

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.*	U and Th values are reported as they are considered to be deleterious elements in rare earth processing. The highest values recorded for these elements on the project to date are 81 ppm ThO_2 and 96 ppm U_3O_8. The length-weighted average values are 11 ppm and 3.5 ppm, respectively. Particle size analysis on 13 mineralised saprolite composites shows that, on average: - 78.5% of REEs are confined to the fines (-25µm) fraction - the fines fraction comprises 37.2% of the bulk saprolite feed mass - the REE grade of the fines fraction is 116% higher than the bulk saprolite feed grade. Diagnostic leach test work in weak hydrochloric acid (HCl) solution (1-2% residual HCl) at 10% solids and 50°C on the fines fraction from 13 mineralised saprolite composites achieves the following results: - 82.9% (average) REE extraction into solution - 18.1 kg/t (average) of HCl (32%) consumed for preferred material types.
Further work	*The nature and scale of planned further work (e.g., tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Airborne electromagnetic survey work is under consideration to help focus future exploration drilling to convert the project's Exploration Target to additional Mineral Resources. Comprehensive metallurgical (including variability) test work is in progress and petrological/SEM studies are being undertaken to identify REE-bearing mineral species.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Exploration Target areas are shown in Figure 1.