ASX ANNOUNCEMENT
Heavy Rare Earths Limited (ASX: HRE)
12 March 2024

METALLURGICAL WORK EXPANDS AREA FOR POTENTIAL DEVELOPMENT

- **Expanded metallurgical program continues to deliver:**
  - **Upgraded rare earth material by simple screening (up to 2.7x in as low as 15.4% of the feed mass)**
  - **Excellent magnet rare earth extraction to leach (as high as 92.3%)**
  - **Low acid consumption (as low as 3.8 kg/t)**
- **Preferred material for metallurgical treatment potentially occupies sizeable extent of currently defined Cowalinya resource**
- **Downstream flowsheet program to a mixed rare earth carbonate product nearing completion**

Heavy Rare Earths Limited (**"HRE"** or **"the Company"**) is pleased to report results from the expansion of its diagnostic leaching program on rare earth mineralisation at its 100 per cent-owned Cowalinya project near Esperance in Western Australia.

HRE Executive Director, Richard Brescianini, said, "Expansion of the diagnostic acid leaching program over a large part of our Cowalinya rare earth resource has confirmed and, for some metrics, exceeded results from last year's sighter test work.

"We have demonstrated the efficient extraction of magnet rare earths, using modest volumes of commercial-grade acid, for many composite samples that represent a range of saprolite feed grades. This data provides HRE with a solid foundation for leach optimization test work, leading to larger-scale piloting and the analysis of the project from a commercial perspective.

"Our parallel workstream to produce mixed rare earth carbonate product has experienced delays associated with sample loss, assay turnaround and flowsheet modification. Nonetheless this program is nearing completion and results are anticipated in the coming weeks."

In earlier phases of the metallurgical program, simple screening of 13 (mainly 5-metre) mineralised composites from 10 drill holes by Perth-based Strategic Metallurgy ("Strategic") demonstrated a 2x rare earth upgrade to -25µm undersize representing 37.2% of the bulk saprolite feed mass *(refer to ASX announcement 13 December 2022)*. Subsequent acid leaching of the undersize by Strategic extracted an average of 82.9% of the magnet rare earths, consuming 18.1 kg of 32% hydrochloric acid per tonne of undersize feed for preferred material types *(refer to ASX announcement 12 July 2023)*.

These results allowed HRE to develop whole rock geochemical algorithms aimed at discriminating preferred material (*i.e.,* both high rare earth extraction and low acid consumption) from non-preferred material (*i.e.,* either low rare earth extraction or high acid consumption). They were used to select an additional 63 (mainly 6-metre) mineralised composites from 55 drill holes across the entire project area for an expanded metallurgical variability program. These composites represent a broad range of feed grades (372 ppm to 3459 ppm TREO), depths (10 m to 44 m) and magnet rare earth composition (11.0% to 39.7% MREO/TREO).

Strategic has completed sizing and diagnostic leach testing of all 63 composites. Results are considered to be unoptimized and presented in Table 2. Sample locations are shown in Figures 1-7. Fifty-seven of the composites are from within the Cowalinya Inferred Mineral Resources (159 Mt @ 870 ppm TREO; *refer to ASX announcement 3 October 2023*) and the remainder are from the project's Exploration Target area (280-1390 Mt @ 330-1330 ppm TREO; *refer to ASX announcement 23 October 2023*).

Table 1: Summary of expanded diagnostic leaching program (preferred material types).

	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)
AVERAGE	**1.8**	**32.3%**	**84.9%**	**1486**	**30.6%**	**24.8**
PREVIOUSLY REPORTED AVERAGE	**1.8**	**42.1%**	**82.9%**	**1462**	**31.1%**	**18.1**

TOTAL RARE EARTHS (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 RARE EARTHS (MREO) = Pr + Nd + Tb + Dy.
ACID is 32% hydrochloric acid (HCl).
AVERAGE calculated on 45 composites which satisfy both >75% MREO leach extraction and <40 kg of 32% HCl per tonne of leach feed (i.e., SM01, SM02, SM03, SM04, SM06, SM07, SM12, SM13, SM14, SM16, SM22, SM24, SM26, SM34, SM36, SM38, SM40, SM42, SM44, SM45, SM47, SM48, SM49, SM50, SM51, SM62, SM68, SM72, SM73, SM74, SM77, SM78, SM79, SM80, SM82, SM93, SM94, SM96, SM99, SM105, SM106, SM113, SM114, SM120, SM125).
PREVIOUSLY REPORTED AVERAGE calculated on 8 composites which satisfy both >75% MREO leach extraction and <40 kg of 32% HCl per tonne of leach feed (i.e., SM01, SM02, SM03, SM04, SM06, SM07, SM12, SM13) (refer to ASX announcements 12 July 2023 and 15 September 2023).

The summary presented in Table 1 shows the expanded program has delivered results that are consistent with earlier phases of the program. The most significant improvement has been the reduction in mass to -25µm undersize rejects thereby reducing feed tonnage to the leach plant. All other measured parameters have largely remained the same, with preferred material types, characterised by high leachability (>75%) of the payable magnet rare earths Pr, Nd, Tb and Dy and low consumption (<40 kilograms per tonne of undersize feed) of 32% hydrochloric acid, potentially occupying a sizeable extent of the currently defined resource (Figure 7).

HRE's geochemical algorithms, which were developed on a small number of samples, have been found to be moderately successful at discriminating preferred from non-preferred material. These algorithms have since been refined using metallurgical data generated from treating 63 additional composites in the current program. Further refinement is possible by treating the balance of 49 metallurgical composites that the Company has prepared but not presented for test work. In any event, HRE maintains confidence in being able to select preferred material from its existing comprehensive inventory of over 5,600 drill assays.

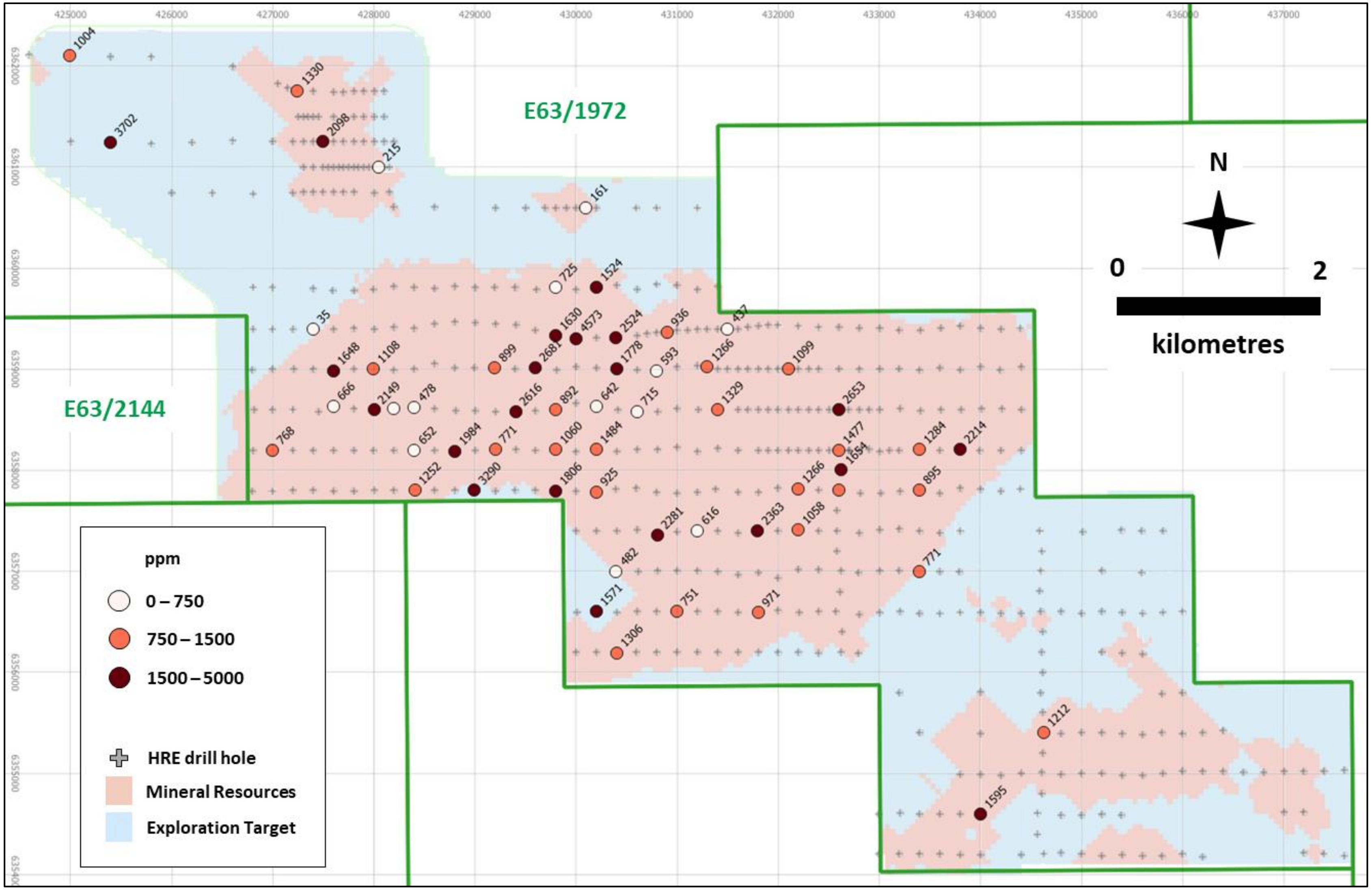

Figure 1: Cowalinya metallurgical composites showing total rare earths (TREO) extracted into solution.

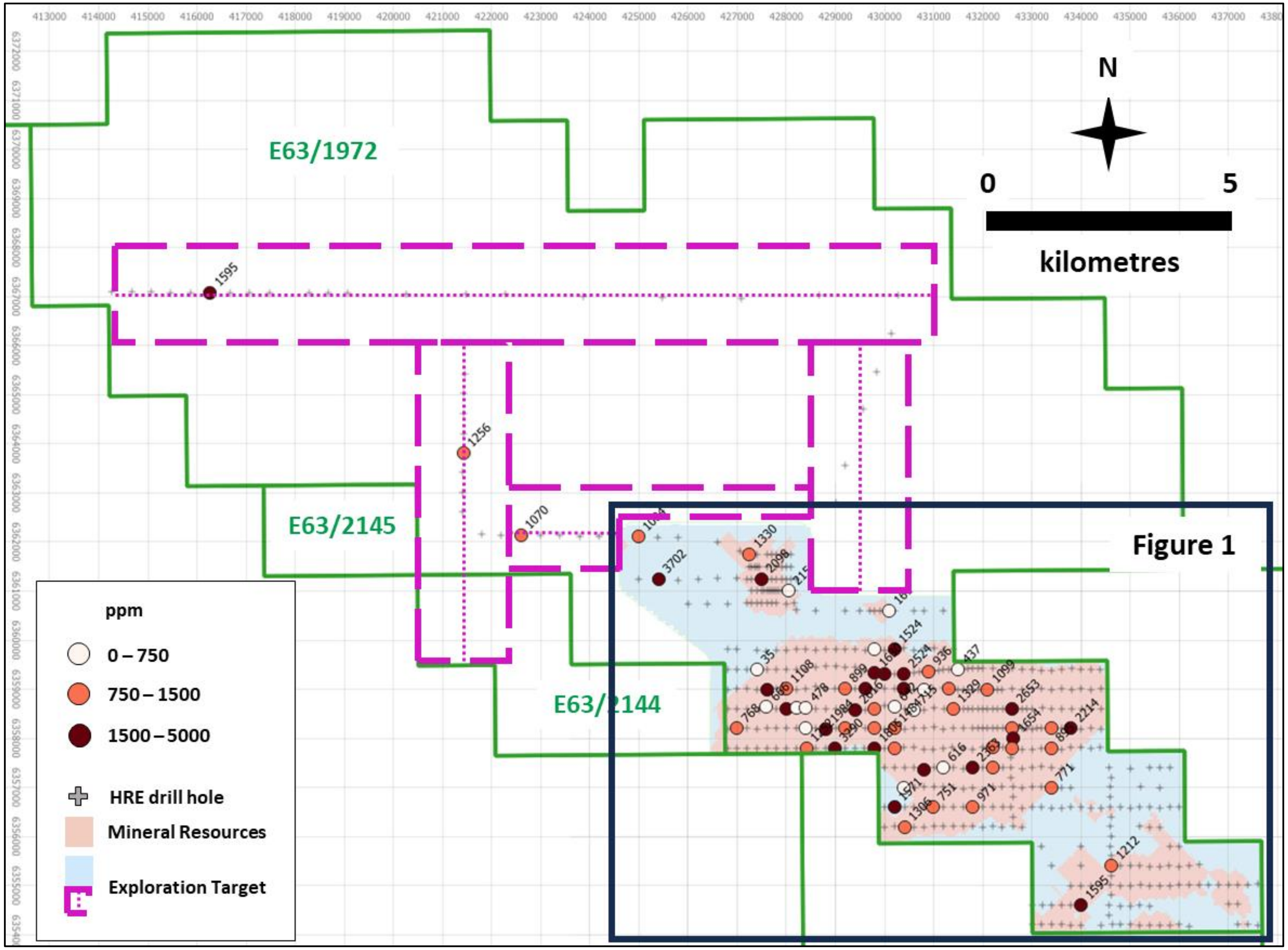

Figure 2: Expanded plan of Cowalinya metallurgical composites showing total rare earths (TREO) extracted into solution.

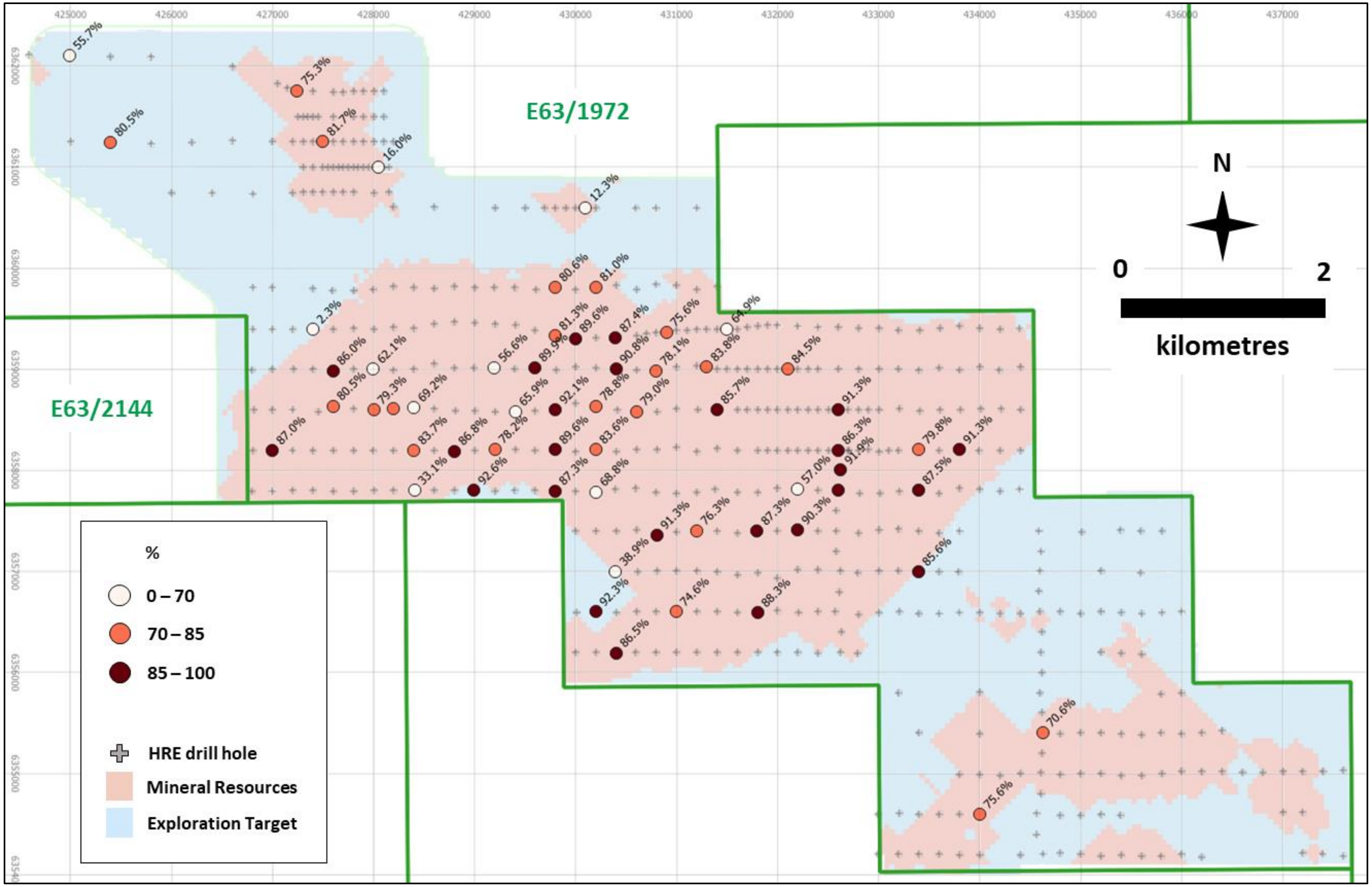

Figure 3: Cowalinya metallurgical composites showing magnet rare earths (MREO) extraction to leach.

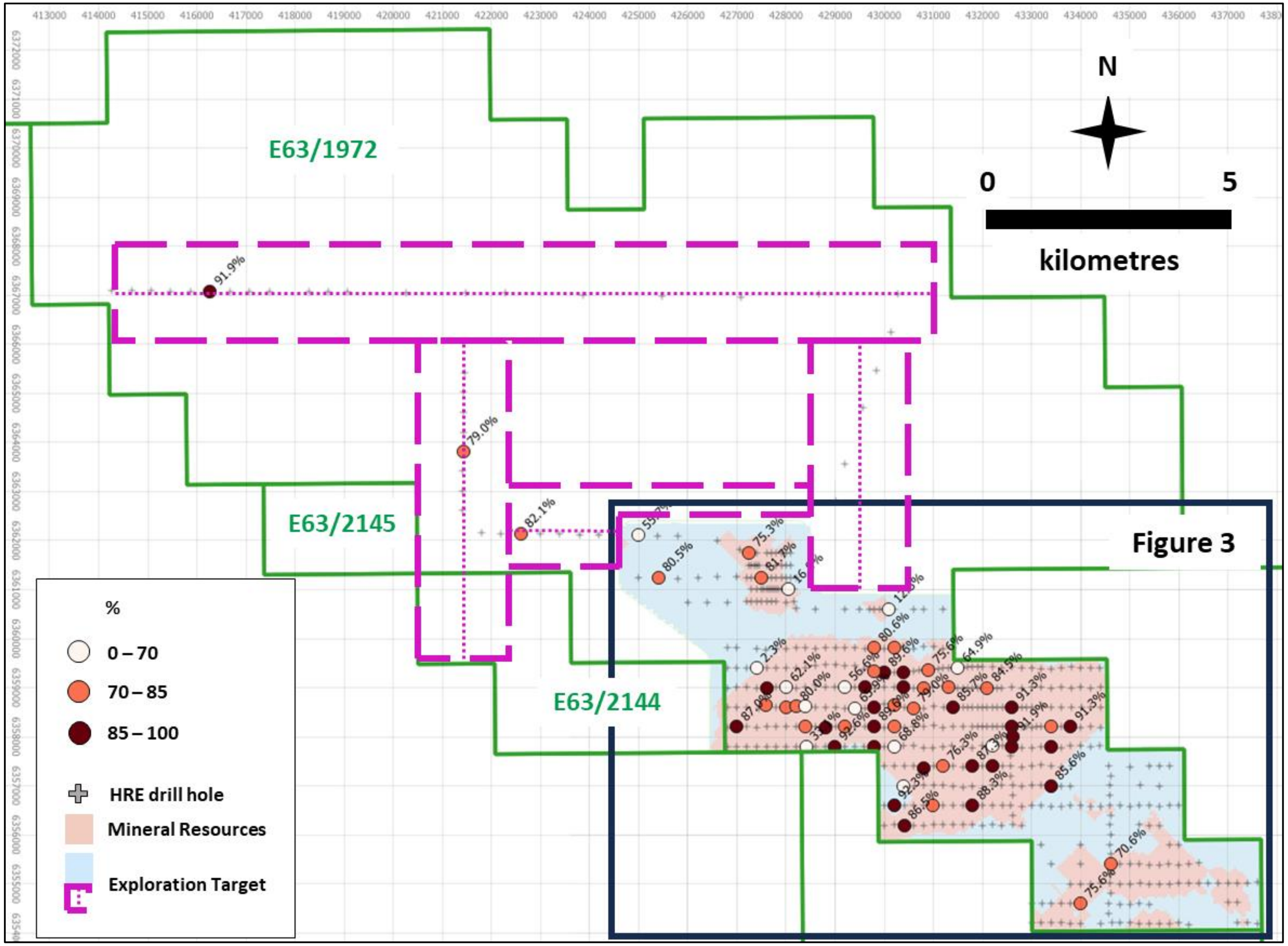

Figure 4: Expanded plan of Cowalinya metallurgical composites showing magnet rare earths (MREO) extraction to leach.

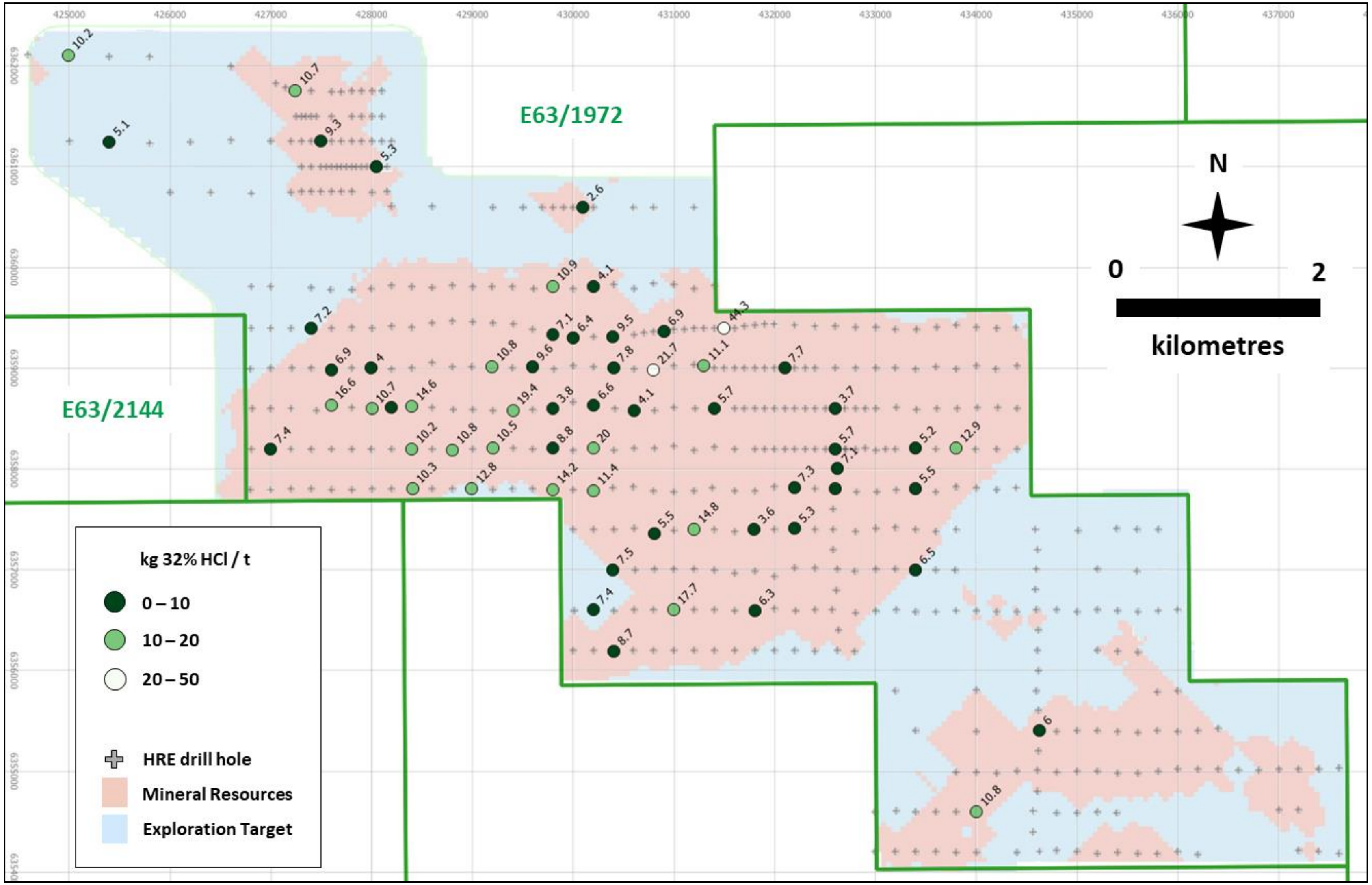

Figure 5: Cowalinya metallurgical composites showing consumption of acid per tonne of saprolite (mined) feed.

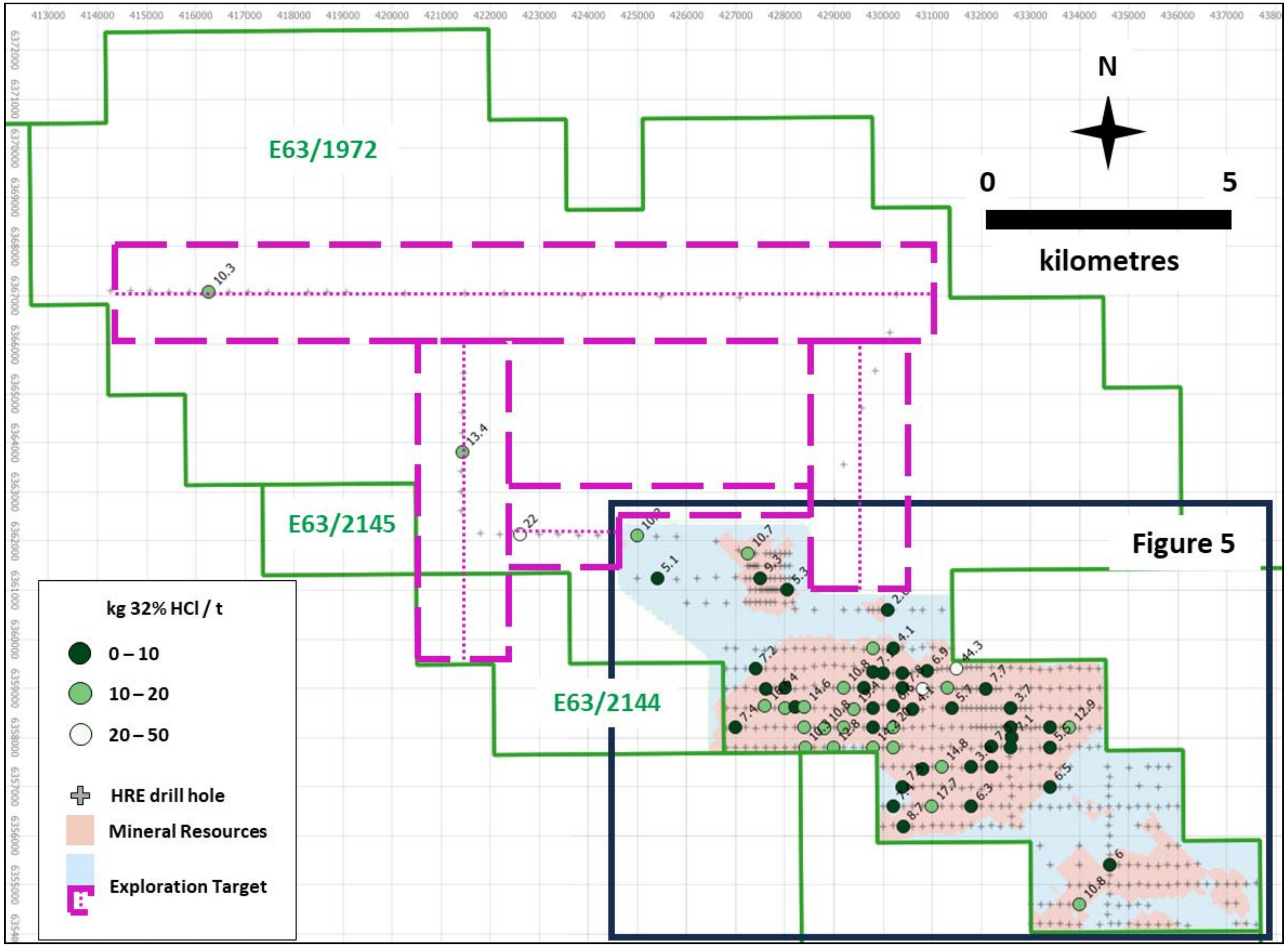

Figure 6: Expanded plan of Cowalinya metallurgical composites showing consumption of acid per tonne of saprolite (mined) feed.

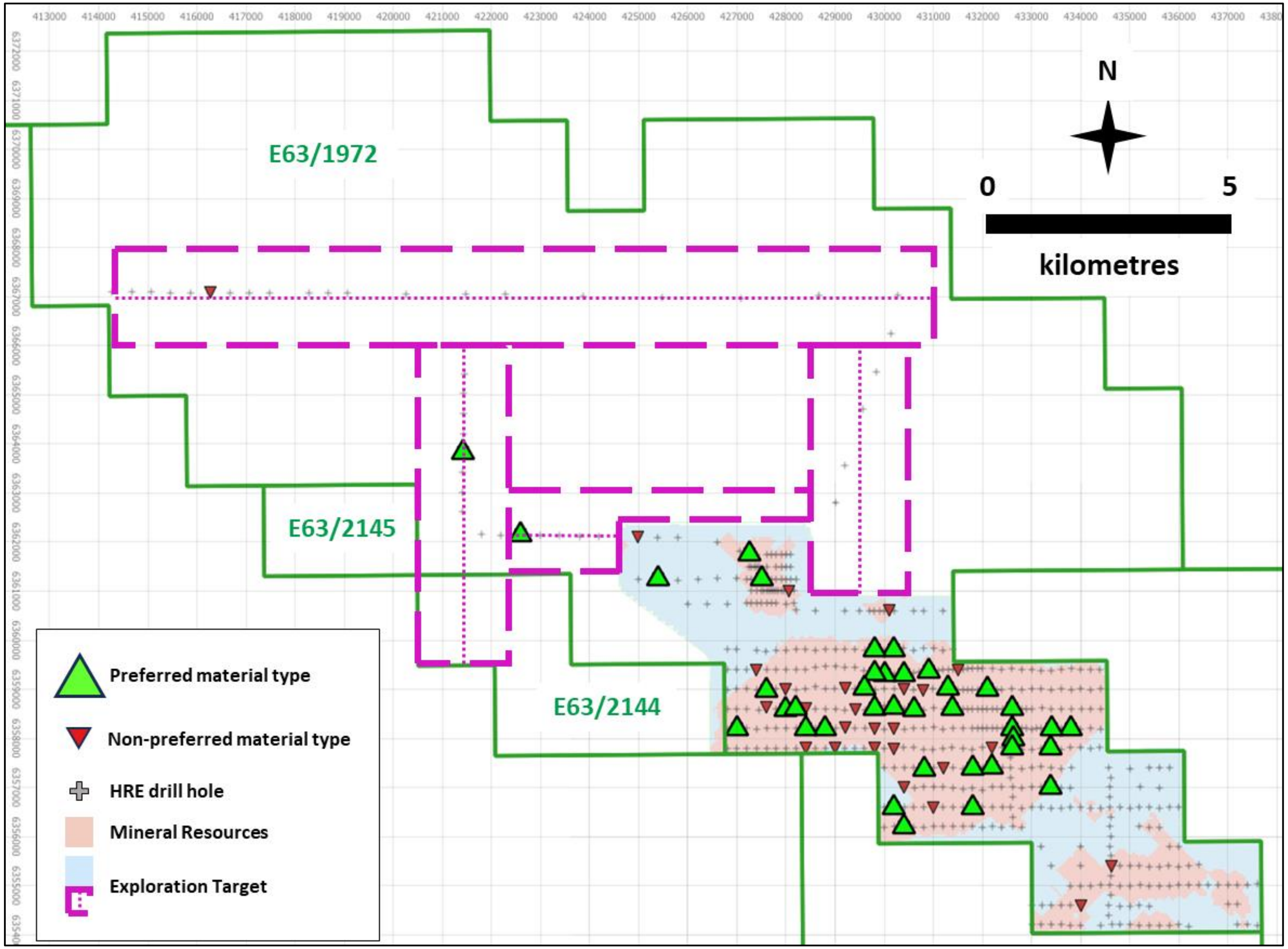

Figure 7: Cowalinya metallurgical composites showing distribution of preferred and non-preferred material types.

Table 2: Summary of expanded diagnostic leaching program.

COMPOSITE	HEAD ASSAY (ppm TREO)	FINES ASSAY (ppm TREO)	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	TOTAL RARE EARTHS (TREO) EXTRACTION TO LEACH	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)	ACID CONSUMPTION (kg HCl/t of saprolite feed)
SM01	1045	1849	1.8	37.8%	79.9%	86.3%	1477	28.7%	15.2	5.7
SM02	750	1077	1.4	51.6%	77.9%	84.5%	839	25.3%	3.8	2.0
SM03	1383	3077	2.2	27.0%	86.2%	91.3%	2653	29.7%	13.6	3.7
SM04	1280	1632	1.3	59.9%	67.3%	84.5%	1099	40.8%	12.8	7.7
SM05	927	2029	2.2	33.3%	37.8%	36.1%	767	28.1%	67.7	22.5
SM06	754	1711	2.3	29.4%	74.0%	83.8%	1266	27.0%	37.8	11.1
SM07	938	1522	1.6	43.6%	61.5%	75.6%	936	39.0%	15.8	6.9
SM08	752	1661	2.2	27.8%	79.8%	89.1%	1325	27.7%	150.4	41.9
SM09	453	774	1.7	35.0%	56.5%	64.9%	437	25.4%	126.5	44.3
SM10	744	1606	2.2	29.5%	10.0%	12.3%	161	22.8%	8.7	2.6
SM11	460	1666	3.6	20.8%	12.9%	16.0%	215	21.6%	25.4	5.3
SM12	1376	2683	1.9	46.6%	78.2%	81.7%	2098	28.8%	20.0	9.3
SM13	1326	2089	1.6	41.1%	63.7%	75.3%	1330	29.7%	26.0	10.7
SM14	791	1975	2.5	25.5%	83.7%	91.9%	1654	31.0%	27.8	7.1
SM16	827	1664	2.0	30.9%	81.6%	86.3%	1358	30.4%	17.9	5.5
SM18	913	1854	2.0	18.0%	65.4%	70.6%	1212	26.2%	33.4	6.0
SM22	581	1209	2.1	23.8%	80.3%	88.3%	971	26.0%	26.7	6.3

COMPOSITE	HEAD ASSAY (ppm TREO)	FINES ASSAY (ppm TREO)	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	TOTAL RARE EARTHS (TREO) EXTRACTION TO LEACH	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)	ACID CONSUMPTION (kg HCl/t of saprolite feed)
SM24	1346	2521	1.9	42.2%	87.8%	91.3%	2214	30.7%	30.6	12.9
SM26	669	1780	2.7	21.0%	72.2%	79.8%	1284	27.7%	24.6	5.2
SM28	902	2036	2.3	27.5%	72.9%	83.6%	1484	39.1%	72.8	20.0
SM31	737	1223	1.7	15.7%	86.6%	89.6%	1060	32.6%	56.2	8.8
SM32	416	1034	2.5	20.1%	74.6%	78.2%	771	28.6%	52.3	10.5
SM34	1055	2339	2.2	27.6%	84.8%	86.8%	1984	38.4%	39.1	10.8
SM36	1738	2165	1.2	42.1%	70.4%	81.0%	1524	36.8%	9.8	4.1
SM38	740	1069	1.4	29.9%	67.8%	80.6%	725	29.1%	36.3	10.9
SM39	481	894	1.9	39.3%	74.5%	80.5%	666	35.1%	42.2	16.6
SM40	1930	2714	1.4	39.3%	79.2%	79.3%	2149	26.6%	27.2	10.7
SM41	510	914	1.8	12.0%	86.6%	90.2%	791	25.1%	51.1	6.1
SM42	515	622	1.2	25.7%	70.6%	80.0%	440	24.7%	38.6	9.9
SM44	1262	3019	2.4	36.0%	83.6%	87.4%	2524	37.1%	26.5	9.5
SM45	1298	2610	2.0	29.1%	76.2%	85.2%	1990	20.4%	31.2	9.1
SM47	1269	1895	1.5	49.7%	64.1%	79.0%	1214	37.3%	16.8	8.4
SM48	3459	5689	1.6	35.8%	80.4%	89.6%	4573	42.2%	18.0	6.4
SM49	470	795	1.7	47.2%	82.5%	88.7%	657	29.3%	25.8	12.2
SM50	1691	2268	1.3	37.6%	71.9%	81.3%	1630	34.1%	18.8	7.1

COMPOSITE	HEAD ASSAY (ppm TREO)	FINES ASSAY (ppm TREO)	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	TOTAL RARE EARTHS (TREO) EXTRACTION TO LEACH	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)	ACID CONSUMPTION (kg HCl/t of saprolite feed)
SM51	597	657	1.1	32.2%	73.6%	82.7%	483	29.7%	16.4	5.3
SM55	1215	1505	1.2	40.8%	2.3%	2.3%	35	28.1%	17.6	7.2
SM56	413	823	2.0	35.5%	72.1%	78.1%	593	22.7%	61.1	21.7
SM59	1338	2070	1.5	17.2%	85.9%	90.8%	1778	28.7%	45.2	7.8
SM62	1654	3305	2.0	27.8%	81.1%	89.9%	2681	39.8%	34.5	9.6
SM64	709	1646	2.3	22.2%	54.6%	56.6%	899	28.8%	48.5	10.8
SM66	718	1990	2.8	12.9%	55.7%	62.1%	1108	26.2%	31.1	4.0
SM68	930	2023	2.2	28.3%	81.5%	86.0%	1648	33.8%	24.3	6.9
SM69	496	712	1.4	29.1%	67.1%	69.2%	478	23.2%	50.3	14.6
SM71	2687	3763	1.4	39.0%	69.5%	65.9%	2616	37.3%	49.7	19.4
SM72	481	1017	2.1	16.3%	87.7%	92.1%	892	28.8%	23.2	3.8
SM73	372	1005	2.7	23.6%	63.8%	78.8%	642	26.5%	28.2	6.6
SM74	464	895	1.9	15.4%	79.9%	79.0%	715	23.7%	26.3	4.1
SM77	565	1064	1.9	31.6%	76.9%	83.6%	818	26.3%	17.8	5.6
SM78	1090	1819	1.7	17.8%	73.0%	85.7%	1329	23.6%	32.2	5.7
SM79	649	966	1.5	21.6%	79.4%	87.0%	768	31.0%	34.4	7.4
SM80	439	844	1.9	29.0%	77.3%	83.7%	652	32.9%	35.0	10.2
SM81	553	842	1.5	16.7%	74.2%	84.2%	624	26.1%	52.1	8.7

COMPOSITE	HEAD ASSAY (ppm TREO)	FINES ASSAY (ppm TREO)	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	TOTAL RARE EARTHS (TREO) EXTRACTION TO LEACH	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)	ACID CONSUMPTION (kg HCl/t of saprolite feed)
SM82	827	1126	1.4	33.1%	79.5%	87.5%	895	30.7%	16.7	5.5
SM83	617	901	1.5	41.2%	72.8%	53.8%	656	7.6%	14.6	6.0
SM84	1457	2418	1.7	30.2%	52.4%	57.0%	1266	23.5%	24.1	7.3
SM86	897	1457	1.6	42.4%	63.5%	68.8%	925	30.9%	26.8	11.4
SM87	1858	2099	1.1	31.5%	86.1%	87.3%	1806	29.6%	45.2	14.2
SM90	3028	3739	1.2	30.1%	88.0%	92.6%	3290	36.6%	42.7	12.8
SM91	1820	3141	1.7	15.7%	39.8%	33.1%	1252	24.7%	65.8	10.3
SM93	492	1272	2.6	26.9%	83.2%	90.3%	1058	28.8%	19.6	5.3
SM94	1107	2774	2.5	24.9%	85.2%	87.3%	2363	39.1%	14.3	3.6
SM95	566	856	1.5	36.2%	72.0%	76.3%	616	25.6%	40.9	14.8
SM96	1214	2599	2.1	17.2%	87.8%	91.3%	2281	31.6%	32.3	5.5
SM99	670	951	1.4	16.2%	81.0%	85.6%	771	26.5%	39.9	6.5
SM101	701	1499	2.1	33.8%	32.2%	38.9%	482	26.1%	22.2	7.5
SM103	943	1326	1.4	35.5%	56.6%	74.6%	751	31.9%	50.0	17.7
SM105	977	1835	1.9	28.6%	85.6%	92.3%	1571	32.7%	25.8	7.4
SM106	917	1878	2.0	32.9%	69.6%	86.5%	1306	39.5%	26.5	8.7
SM109	827	2449	3.0	22.9%	65.1%	75.6%	1595	25.8%	47.2	10.8
SM111	1426	1827	1.3	35.2%	54.9%	55.7%	1004	19.2%	29.0	10.2

COMPOSITE	HEAD ASSAY (ppm TREO)	FINES ASSAY (ppm TREO)	TREO UPGRADE	MASS RECOVERY TO UNDERSIZE (% of total mass)	TOTAL RARE EARTHS (TREO) EXTRACTION TO LEACH	MAGNET RARE EARTHS (MREO) EXTRACTION TO LEACH	TOTAL RARE EARTHS EXTRACTED (ppm TREO)	EXTRACTED MREO/TREO	ACID CONSUMPTION (kg HCl/t of leach feed)	ACID CONSUMPTION (kg HCl/t of saprolite feed)
SM113	949	1338	1.4	55.8%	80.0%	82.1%	1070	31.4%	39.5	22.0
SM114	1110	1559	1.4	41.4%	80.6%	79.0%	1256	24.0%	32.4	13.4
SM117	1561	1805	1.2	22.6%	88.4%	91.9%	1595	35.4%	45.5	10.3
SM120	2138	4505	2.1	24.2%	82.2%	80.5%	3702	21.2%	21.1	5.1
SM125	930	1600	1.7	30.4%	85.9%	89.8%	1375	26.1%	14.5	4.4
AVERAGE – ALL			**1.8**	**30.6%**	**71.2%**	**76.9%**	**1304**	**29.3%**	**34.4**	**10.0**
RANGE			**1.1-3.6**	**12.0-59.9%**	**2.3-88.4%**	**2.3-92.6%**	**35-4573**	**7.6-42.2%**	**3.8-150.4**	**2.0-44.3**
AVERAGE – PREFERRED MATERIAL TYPES			**1.8**	**32.3%**	**77.8%**	**84.9%**	**1486**	**30.6%**	**24.8**	**7.7**

TOTAL RARE EARTHS (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 RARE EARTHS (MREO) = Pr + Nd + Tb + Dy.
ACID is 32% hydrochloric acid (HCl).
AVERAGE – PREFERRED MATERIAL TYPES calculated on 45 composites which satisfy both >75% MREO leach extraction and <40 kg of 32% HCl per tonne of leach feed (i.e., SM01, SM02, SM03, SM04, SM06, SM07, SM12, SM13, SM14, SM16, SM22, SM24, SM26, SM34, SM36, SM38, SM40, SM42, SM44, SM45, SM47, SM48, SM49, SM50, SM51, SM62, SM68, SM72, SM73, SM74, SM77, SM78, SM79, SM80, SM82, SM93, SM94, SM96, SM99, SM105, SM106, SM113, SM114, SM120, SM125).

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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

The Exploration Results contained in this announcement were compiled by Mr. Richard Brescianini. Mr. Brescianini is a Member of the Australian Institute of Geoscientists (MAIG). He is a director and full-time employee of Heavy Rare Earths Limited. Mr. Brescianini has more than 35 years' experience in mineral exploration and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 JORC Code.

The information in this announcement that relates to metallurgical results is based on information compiled by Heavy Rare Earths Limited and reviewed by Mr. Gavin Beer of Met-Chem Consulting Pty. Ltd. who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr. Beer has sufficient experience that is relevant to the metallurgical test work which was undertaken to qualify as a Competent Person as defined in the 2012 JORC Code. Mr. Beer consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The Mineral Resources and Exploration Target contained in this announcement were compiled by Mr. Robin Rankin. Mr Rankin is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM) and accredited as a Chartered Professional by the AusIMM in the Geology discipline. He is the Principal Consulting Geologist and operator of independent geological consultancy GeoRes. Mr Rankin has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 JORC Code.

Table 3: Saprolite composites used in metallurgical test work.

COMPOSITE	HOLE NO.	FROM (m)	TO (m)	INTERVAL (m)	TREO (ppm)	TREO-CeO_2 (ppm)	MAGNET REOs/TREO
SM01	AC4	24	29	5	1045	724	29.2%
SM02	AC16	12	17	5	750	473	24.6%
SM03	AC16	24	29	5	1383	1131	30.2%
SM04	AC28	14	19	5	1280	1158	32.2%
SM05	AC28	32	37	5	927	656	29.3%
SM06	AC36	20	25	5	754	511	25.3%
SM07	AC41	11	16	5	938	816	31.9%
SM08	AC41	22	27	5	752	526	26.2%
SM09	AC47	17	22	5	453	273	21.5%
SM10	AC57	14	18	4	744	373	18.3%
SM11	AC69	13	18	5	460	241	18.9%
SM12	AC89	28	33	5	1376	969	28.7%
SM13	AC104	24	29	5	1326	1003	26.3%
SM14	AC110	20	26	6	791	628	28.8%
SM16	AC111	22	28	6	827	674	32.5%
SM18	AC130	32	38	6	913	638	25.1%
SM22	AC175	28	34	6	581	437	25.5%
SM24	AC179	14	20	6	1346	1048	28.4%
SM26	AC181	19	25	6	669	487	26.9%
SM28	AC194	22	28	6	902	823	32.7%
SM31	AC196	27	33	6	737	641	30.8%
SM32	AC199	23	29	6	416	301	29.6%
SM34	AC201	32	38	6	1055	939	36.9%
SM36	AC212	24	30	6	1738	1246	32.3%
SM38	AC214	22	27	5	740	587	24.5%
SM39	AC219	19	25	6	481	396	31.8%
SM40	AC221	17	23	6	1930	1257	26.8%
SM41	AC221	31	37	6	510	320	23.2%
SM42	AC222	17	23	6	515	345	22.5%
SM44	AC223	17	23	6	1262	973	33.3%
SM45	AC223	25	28	3	1298	730	18.2%

SM47	AC225	16	22	6	1269	868	29.0%
SM48	AC225	28	34	6	3459	3169	36.2%
SM49	AC226	18	24	6	470	340	27.5%
SM50	AC226	26	32	6	1691	1422	31.3%
SM51	AC226	32	38	6	597	405	27.2%
SM55	AC269	10	16	6	1215	785	28.5%
SM56	AC273	22	28	6	413	242	20.6%
SM59	AC275	27	33	6	1338	1223	26.5%
SM62	AC279	31	37	6	1654	1470	32.8%
SM64	AC281	26	32	6	709	449	27.4%
SM66	AC287	36	42	6	718	451	24.8%
SM68	AC289	15	21	6	930	706	31.6%
SM69	AC297	19	23	4	496	375	22.9%
SM71	AC302	26	30	4	2687	2187	39.7%
SM72	AC304	26	32	6	481	334	27.2%
SM73	AC306	21	27	6	372	259	21.7%
SM74	AC308	24	28	4	464	294	23.8%
SM77	AC312	24	30	6	565	403	24.0%
SM78	AC312	38	44	6	1090	814	20.4%
SM79	AC322	25	31	6	649	508	29.6%
SM80	AC329	24	30	6	439	339	29.8%
SM81	AC329	30	36	6	553	379	22.2%
SM82	AC339	30	36	6	827	596	29.1%
SM83	AC344	22	26	4	617	209	11.0%
SM84	AC344	26	32	6	1457	782	22.9%
SM86	AC354	19	25	6	897	595	27.6%
SM87	AC356	28	34	6	1858	1648	28.1%
SM90	AC360	27	33	6	3028	2740	30.5%
SM91	AC363	34	40	6	1820	1612	29.3%
SM93	AC380	18	24	6	492	368	25.9%
SM94	AC382	15	21	6	1107	965	37.9%
SM95	AC385	15	21	6	566	356	22.7%
SM96	AC387	30	36	6	1214	1030	30.6%
SM99	AC395	26	32	6	670	446	24.6%

SM101	AC409	17	23	6	701	413	22.3%
SM103	AC413	17	23	6	943	759	23.0%
SM105	AC417	23	29	6	977	818	28.5%
SM106	AC430	19	25	6	917	764	30.4%
SM109	AC433	16	22	6	827	511	23.0%
SM111	AC446	20	26	6	1426	606	20.2%
SM113	AC452	21	27	6	949	603	30.6%
SM114	AC458	37	43	6	1110	701	28.6%
SM117	AC471	18	24	6	1561	1304	35.8%
SM120	AC487	18	24	6	2138	1164	23.0%
SM125	AC544	23	29	6	930	650	26.5%

Table 4: Cowalinya air core holes for which metallurgical results are reported.

HOLE NO.	NORTHING (m)	EASTING (m)	EVEVATION (m)	DIP (°)	TOTAL DEPTH (m)
AC4	6358200	432600	261.3	-90	36
AC16	6358600	432600	260.9	-90	32
AC28	6359000	432100	265.2	-90	39
AC36	6359020	431300	259.0	-90	31
AC41	6359365	430900	260.0	-90	30
AC47	6359400	431500	261.0	-90	28
AC57	6360600	430100	267.7	-90	21
AC69	6361000	428050	261.4	-90	22
AC89	6361250	427500	261.8	-90	44
AC104	6361755	427245	259.1	-90	39
AC110	6358001	432626	262.6	-90	29
AC111	6357803	432597	262.8	-90	31
AC130	6355405	434624	261.9	-90	45
AC175	6356590	431801	258.7	-90	45
AC179	6358206	433800	267.6	-90	45
AC181	6358204	433399	265.5	-90	27
AC194	6358205	430198	257.7	-90	50
AC196	6358202	429801	257.2	-90	38
AC199	6358210	429200	257.5	-90	48

AC201	6358191	428802	256.7	-90	47
AC212	6359813	430201	263.3	-90	37
AC214	6359810	429799	262.4	-90	28
AC219	6358636	427598	255.4	-90	42
AC221	6358596	428000	254.4	-90	47
AC222	6358612	428200	256.3	-90	39
AC223	6359308	430398	258.1	-90	29
AC225	6359305	430000	259.4	-90	36
AC226	6359329	429799	260.1	-90	55
AC269	6359394	427399	259.6	-90	23
AC273	6358983	430799	262.0	-90	29
AC275	6359002	430399	259.7	-90	38
AC279	6359017	429598	258.6	-90	40
AC281	6359014	429198	259.5	-90	34
AC287	6359001	427997	254.2	-90	44
AC289	6358985	427599	256.3	-90	36
AC297	6358620	428400	259.3	-90	46
AC302	6358580	429402	255.5	-90	33
AC304	6358599	429803	256.1	-90	52
AC306	6358634	430204	259.1	-90	30
AC308	6358582	430602	256.0	-90	29
AC312	6358599	431399	262.9	-90	55
AC322	6358197	427000	254.6	-90	42
AC329	6358198	428402	258.1	-90	44
AC339	6357804	433396	263.8	-90	45
AC344	6357813	432197	263.3	-90	35
AC354	6357786	430201	258.7	-90	30
AC356	6357797	429798	256.4	-90	59
AC360	6357800	428997	253.7	-90	46
AC363	6357801	428403	260.4	-90	46
AC380	6357408	432200	263.1	-90	25
AC382	6357401	431799	262.0	-90	30
AC385	6357404	431200	256.1	-90	27
AC387	6357360	430803	258.7	-90	46
AC395	6356997	433395	263.7	-90	33

AC409	6356998	430398	257.1	-90	26
AC413	6356600	430996	257.1	-90	28
AC417	6356600	430199	255.6	-90	30
AC430	6356194	430401	256.7	-90	30
AC433	6354597	434002	254.1	-90	33
AC446	6362103	424987	260.2	-90	46
AC452	6362139	422593	251.8	-90	40
AC458	6363814	421420	252.2	-90	49
AC471	6367086	416273	249.3	-90	27
AC487	6361245	425397	262.7	-90	29
AC544	6358203	432610	261.2	-90	40

JORC Code, 2012 Edition – 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 air core holes have been drilled by Heavy Rare Earths (HRE) on the Cowalinya project to date: 109 holes in 2021 (AC1-AC109) and 441 holes in 2022 (AC110-AC547). 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 air core drilled by two companies exploring for gold (AngloGold Ashanti Ltd and Great Southern Gold Pty Ltd). One-metre samples are collected from a cyclone into plastic bags. In the 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 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. 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 air core drilling, regular air and manual cleaning of cyclone is being undertaken. Certified standards and duplicate samples are submitted with drill samples.
	Aspects of the determination of mineralisation that are Material to the Public Report.	Air core drilling is used to obtain 1m samples which are collected in plastic bags. Samples ranging from 1m to 2m 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.

Criteria	JORC Code Explanation	Commentary
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 air core, 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.*	Air core 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. Air core 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.
	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 air core holes are completely geologically logged.

Criteria	JORC Code Explanation	Commentary
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.	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.
	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.
	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.

Criteria	JORC Code Explanation	Commentary
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.*	Analyses of drilling composites and metallurgically-generated solids samples are done at LabWest using their AF-02S scheme: 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 aluminium (Al), calcium (Ca), iron (Fe), magnesium (Mg), phosphorus (P), scandium (Sc), thorium (Th) and uranium (U) are measured. Analyses of metallurgically-generated liquor samples are done at LabWest using their SOL-03 scheme: direct spray and solution dilution with ICP-MS/OES finish. A suite of 67 elements, including the 15 REEs plus Al, Ca, Fe, Mg, P, Sc, Th and U, are measured.
	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.
	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 every 20th sample. Field duplicates are taken every 20th sample. LabWest uses OREAS standards, blanks and sample repeats. Acceptable levels of accuracy have been achieved.
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.

Criteria	JORC Code Explanation	Commentary
	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).
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.	Data spacing is considered sufficient for this style of mineralisation to establish Inferred Mineral Resources. The mineralisation occurs as extensive, generally flat lying supergene blankets hosted in saprolitic clays.
	Whether sample compositing has been applied.	All 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.
Orientation of data in relation	*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.

Criteria	JORC Code Explanation	Commentary
to geological structure	*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)

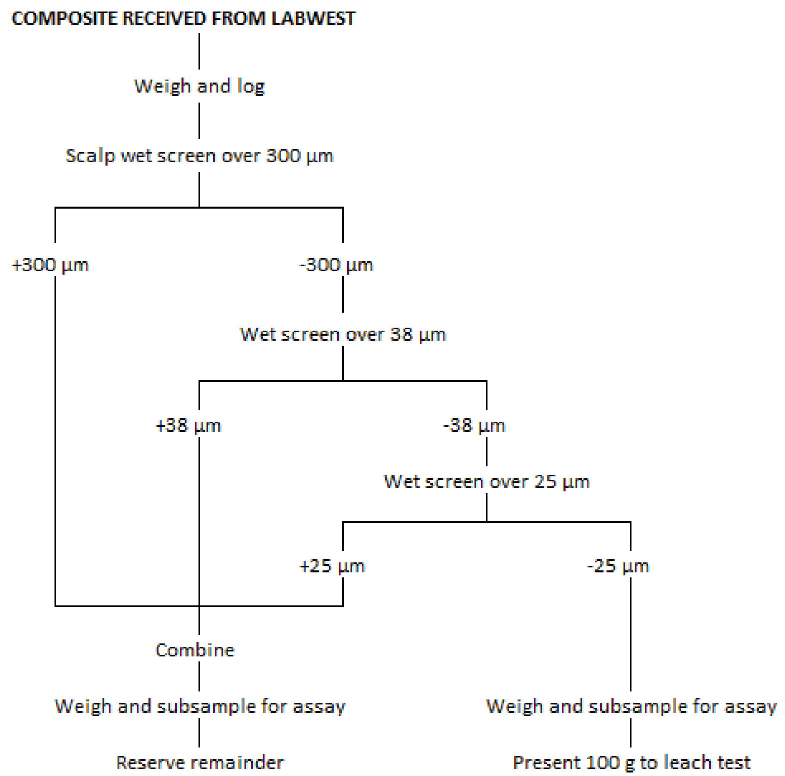
Criteria	JORC Code Explanation	Commentary
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness 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 Department of Energy, Mines, Industry Regulation and Safety (DMIRS) and the relevant Cultural Heritage Protection Agreement.

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. 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 drilling from which metallurgical composites are sourced is shown in Table 4.

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 >1000 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 1-7 for plan views showing drillhole collar and metallurgical composite 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.*	Head assays for all metallurgical composites are presented in Tables 2 and 3.

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 ThO2 and 96 ppm U3O8. 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 hydrochloric acid (HCl) solution (1-2% residual HCl) at 10% solids and 50°C on the fines fraction achieves the following results: - 82.9% (average) magnet REE (MREE) extraction into solution - 18.1 kg/t (average) of HCl (32%) consumed for material types characterized by >75% MREE extraction and <40 kg of HCl per tonne of fines feed. For the diagnostic leach variability program, 63 metallurgical composites were prepared as follows: - Sample compositing was undertaken in the field from one-metre drill samples resulting in 4-4.5 kg sample composites - At LabWest composites were dried, crushed to -2 mm and rotary split to produce a 500 g sample for head assay (AF-02S) and a 1 kg sample for wet screening and subsequent acid leaching by Strategic Metallurgy (Strategic). The following flowchart documents the general procedure adopted by Strategic:



Diagnostic leach variability test work on the fines fraction of 76 mineralised composites in hydrochloric acid (HCl) solution (1-2% residual HCl) at 10% solids and 50°C on the fines fraction achieves the following results:

- 77.8% (average) REE extraction into solution
- 24.8 kg/t (average) of HCl (32%) consumed

for material types characterized by >75% MREE extraction and <40 kg of HCl per tonne of fines feed.

Criteria	JORC Code Explanation	Commentary
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).*	A metallurgical program to produce samples of a mixed rare earth carbonate product is in progress, and petrological 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 Figures 2, 4, 6 and 7.