ASX ANNOUNCEMENT
Heavy Rare Earths Limited (ASX: HRE)
3 August 2023

EXPLORATION COMMENCES ON DUKE RARE EARTH PROJECT IN THE NORTHERN TERRITORY

- **Assays of up to 732 ppm total rare earths in historical drilling and surface rock chips**
- **First pass soil survey underway over extensive area of rare earth enrichment and anomalous radiometric thorium**
- **The primary rare earth exploration target is unconformity type vein mineralisation similar to Browns Range in Western Australia**
- **Up to 20 metres of clay-rich regolith overlying rare earth-enriched granite also demonstrates prospectivity for ion-adsorption type rare earth deposits**

Heavy Rare Earths Limited (**"HRE"** or **"the Company"**) is pleased to report on-ground exploration for rare earths has commenced at its 100 per cent-owned Duke project in the Northern Territory.

The Duke project comprises two adjacent granted exploration licences EL33101 and EL33194 that together cover an area of 255 km^2. They are located on the Phillip Creek pastoral lease approximately 50 kilometres north-west of Tennant Creek and 25 kilometres west of the Stuart Highway. Both the Alice Springs to Darwin railway and Amadeus natural gas pipeline cross the central part of the project area (Figure 1). Exploration on and around HRE's tenement package has in the past focused on ironstone hosted Cu-Au-Bi and IOCG deposits, but this is the first time the area will be subject to exploration for rare earths.

The exploration model being investigated by HRE is an unconformity-type REE deposit similar to those at Northern Minerals' (ASX: NTU) Browns Range project in Western Australia. The unconformity in question occurs between the Proterozoic Warrego Granite and metamorphic rocks of the Flynn Group and overlying sandstone and conglomerate of the Tomkinson Creek Group. Rare earths are expected to be hosted in xenotime, an yttrium phosphate mineral that contains high concentrations of heavy rare earths (HREE). A secondary target for exploration at Duke is HREE-enriched ion-adsorption clay-type mineralisation hosted in saprolite developed on the extensive but poorly outcropping Warrego Granite.

Reconnaissance Visit – April 2023

HRE undertook a reconnaissance visit to the project area in April 2023 to assess access. During the visit prominent thorium (Th) anomalies from a previous explorer's airborne magnetic/radiometric survey over the project area were investigated on the ground using a portable XRF (pXRF) and gamma-ray spectrometer. In addition, core from diamond drill hole PCRD001 drilled in 2009 to test a uranium anomaly from the same airborne survey (and in the same general area of the Th anomalies) was examined at the Northern Territory

Geological Survey's core library in Alice Springs. PCRD001 intersected Warrego Granite from 5 metres depth.

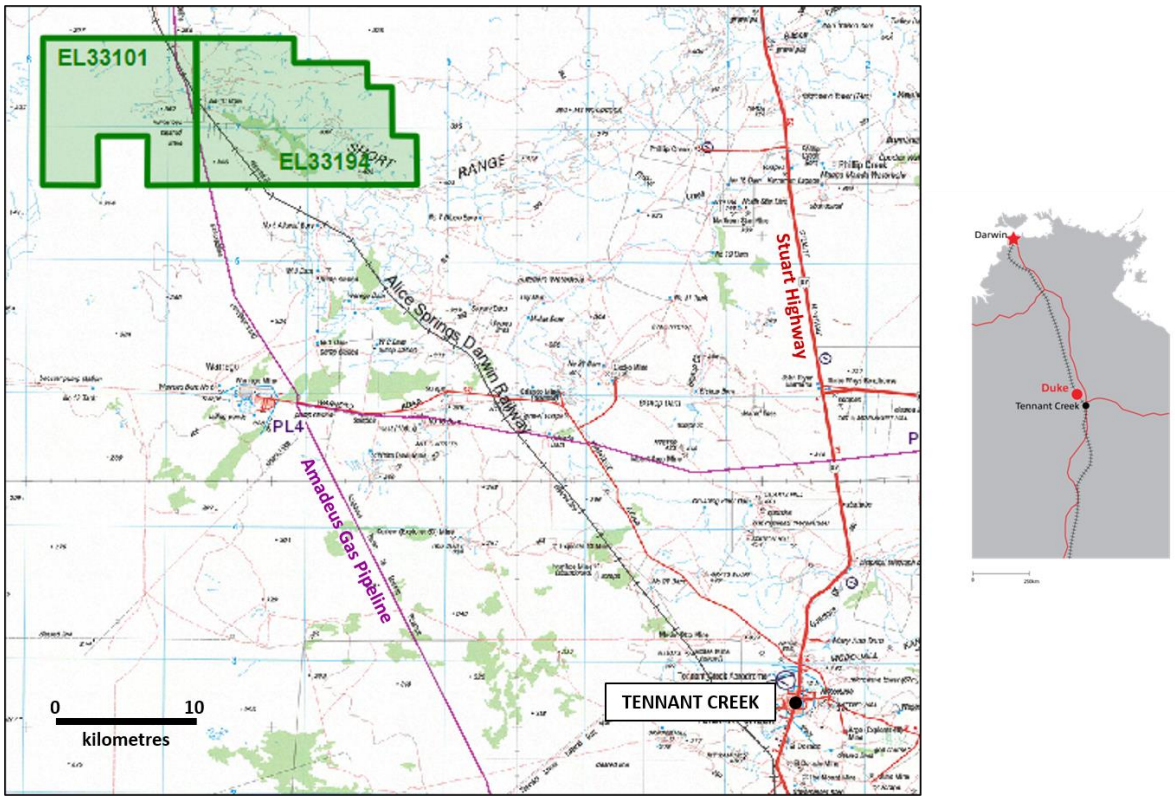

Figure 1: Location of Duke project tenements EL33101 and EL33194.
Background image: 1:250,000 scale Tennant Creek Topographic Map.

pXRF analysis confirmed the presence of elevated rare earths both at outcrop and in the Warrego Granite. In situ analysis of silcrete outcrops and zones of quartz veining returned values ranging from below detection limits up to 0.21% TREE (total rare earths). Forty spot pXRF analyses on Warrego Granite intersected by PCRD001 averaged 745 ppm TREE with a maximum of 0.2% (2000 ppm) TREE.

Table 1: Rock chip and drill core assays from April 2023 reconnaissance visit.
MAGNET REEs = Pr + Nd + Tb + Dy. Monzonite = Warrego Granite.

SAMPLE ID	SAMPLE TYPE	SAMPLE DEPTH	LITHOLOGY	TREE (ppm)	MAGNET REEs/TREE	Th (ppm)
DUK001a	Rock Chip	Surface	Quartz Vein	300	19.0%	17
DUK001b	Rock Chip	Surface	Quartz vein	348	19.8%	21
DUK002	Rock Chip	Surface	Quartz Vein	98	19.4%	14
DUK003	Rock Chip	Surface	Silcrete	53	18.5%	29
DUK004	Rock Chip	Surface	Silcrete	616	18.6%	127
DUK005	Drill Core	~164 m	Monzonite	536	20.8%	85
DUK006	Drill Core	~176 m	Monzonite	732	21.1%	112

A total of seven samples (five rock chip and two drill core samples) were assayed by LabWest Minerals Analysis in Perth. Five of the seven samples returned >300 ppm TREE with a maximum of 732 ppm TREE (Table 1). Rare earth enrichment is confirmed in an extensive zone of hydrothermal quartz veining, in surficial silcrete, and in the Warrego Granite. The latter is particularly significant because the granite may be a suitable source for an overlying ion-adsorption type REE deposit in laterite (saprolite), and locally up to 20 metres of saprolite was intersected in this area during drilling carried out during the 1970s.

First-pass Exploration – August 2023

Encouraged by these results, the Company has now commenced a systematic campaign of soil sampling comprising 420 samples over an area of about 23 km^2 (Figure 2). It is planned to cover the above-mentioned area of Th anomalism, a large zone of quartz veining and a sizeable but discrete Cu-Au-Bi-in-soil anomaly identified in previous exploration but never drilled. Samples will be collected along 400 metre-spaced lines on 200 metre centres. The survey is expected to take 2-3 weeks to complete and assay will be via the innovative UltraFine+™ method which targets the extremely fine component of soils (<2 µm). There is minimal outcrop of Proterozoic rock across the survey area, which is mainly covered by sheet and dune sand, and sandy soil.

In addition to the soil survey, the effectiveness of stream sediment sampling will be assessed to explore the more difficult-to-access northern, western and eastern portions of the project area.

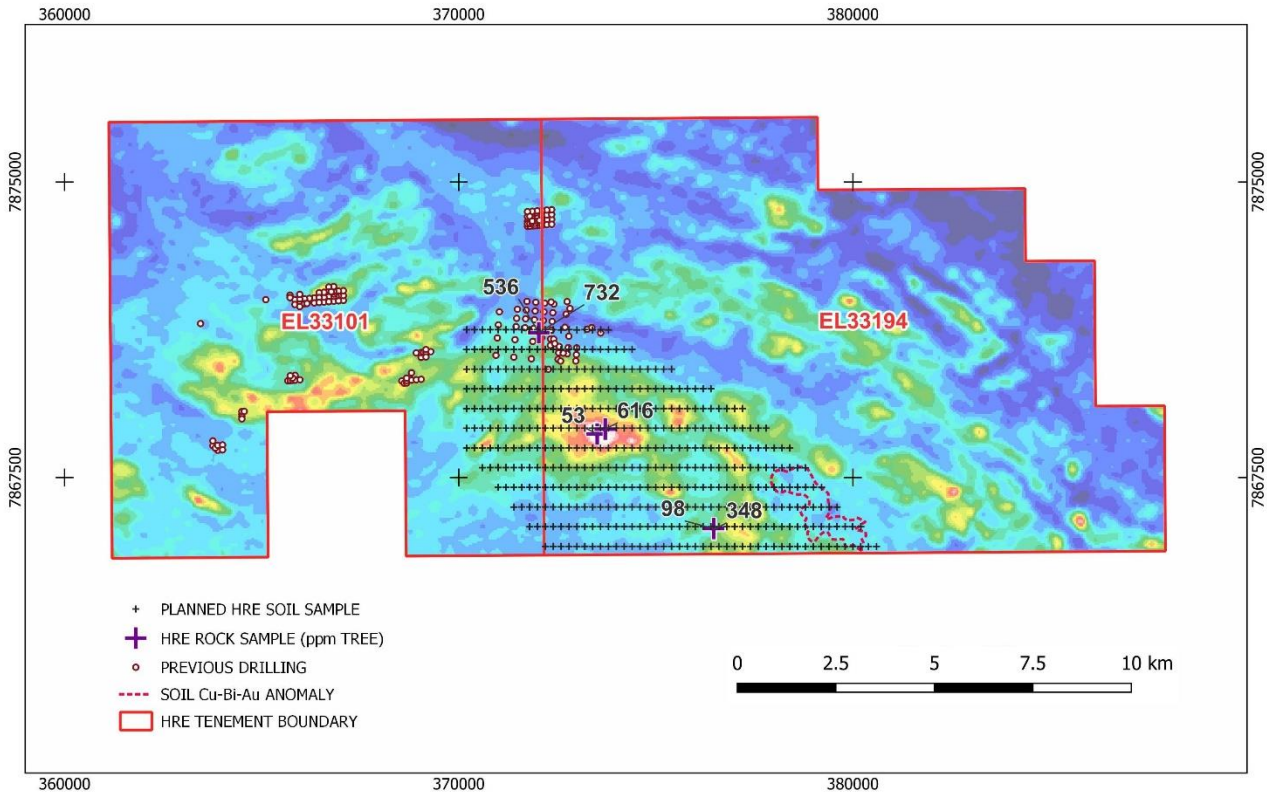

Figure 2: Duke project tenements showing location of planned soil survey, rock chip samples and historic drilling.

Background image: Th channel from historic airborne radiometric survey.

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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 Norseman in Western Australia. This is a clay-hosted rare earth project with an Inferred Resource of 28 Mt @ 625 ppm TREO and a desirable rare earth composition where 25% are the valuable magnet rare earths and 23% the strategic heavy rare earths.

Competent Person's Statement

The Exploration Results contained in this announcement were compiled by Dr. Andy Wilde of Wilde Geoscience. Dr. Wilde is a Fellow and RPGeo (Registered Professional Geoscientist) of the Australian Institute of Geoscientists (AIG). He 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. Dr. Wilde consents to the inclusion in this announcement of the matters based on the Exploration Results in the form and context in which they appear.

Table 2: Rock chip and drill core samples for which assays are reported.

SAMPLE ID	SAMPLE TYPE	DRILL HOLE NO.	NORTHING (m)	EASTING (m)	DIP	AZIMUTH	TOTAL DEPTH (m)
DUK001a	Rock Chip	-	7866183	376483	-	-	-
DUK001b	Rock Chip	-	7866183	376483	-	-	-
DUK002	Rock Chip	-	7866206	376468	-	-	-
DUK003	Rock Chip	-	7868605	373514	-	-	-
DUK004	Rock Chip	-	7868728	373718	-	-	-
DUK005	Drill Core	PCRD001	7871181	372027	-60°	180°	475.5
DUK006	Drill Core	PCRD001	7871181	372027	-60°	180°	475.5

2012 JORC Code – Table 1

Section 1: Sampling Techniques and Data

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.	Surface rock samples consisted of approximately 1 kg of chips from various outcrops. These samples are representative of approximately 1 m^2. Samples from historic drillhole PCRD001 were 10 – 15 cm lengths of quarter core, the location of which was determined by elevated rare earths (REE) in spot portable XRF (pXRF) analyses.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	The pXRF instrument used by Heavy Rare Earths Limited (HRE) (see below) analyses a relatively small volume of rock. Larger samples were taken in some cases where pXRF recorded elevated REE in order to verify these analyses with a more representative (much larger volume) sample.
	Aspects of the determination of mineralisation that are Material to the Public Report.	Not applicable.
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.).	HRE has not conducted any drilling to date. PCRD001 is an historic diamond drillhole, drilled in 2009 by Rum Jungle Uranium (RJU). Details of the drilling methods used are not available in open file reports.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Recovery data for PCRD001 are not available and presumably were not recorded.
	Measures taken to maximize sample recovery and ensure representative nature of the samples.	Not known.
	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.	Not known.
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.	PCRD001 was visually inspected by HRE and analysed with pXRF and gamma ray spectrometry but was not systematically logged. Qualitative lithological logging data are available in RJU's open file report CR2010-0567.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	See above.
	The total length and percentage of the relevant intersections logged.	See above.

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.	Samples of sawn quarter core were taken from PCRD001.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Not applicable.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Relatively small volumes of rock were submitted for analysis, which is considered adequate for this level of exploration.
	Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.	HRE sampling protocol requires that certified reference material (CRM) and blanks are inserted after every 20 samples collected.
	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.	Numerous chips from various parts of outcrop were taken in order that the surface samples were as representative as possible.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Quarter core samples from PCRD001 were approximately 10 – 15 cm in length and may not be sufficiently representative given the coarse grain size (several centimetres) of the Warrego Granite.
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.	Samples were prepared at LabWest Minerals Analysis (LabWest) in Perth, Western Australia, using sodium peroxide fusion and analysed using ICP-MS. This gives highly accurate and precise analyses for each of the 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). This technique is considered to be a 'total' digest.
	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.	The Olympus Vanta pXRF instrument and Radiation Solutions RS-125 gamma ray spectrometer used by HRE utilized internal calibration only.
	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.	HRE's sampling protocols require that CRMs (including blanks) and field duplicates are inserted into each analytical batch at every 20th sample. LabWest uses regular duplicates, CRMs and blanks. Based on assessment of a limited number of CRMs an acceptable level of accuracy and precision has been achieved by LabWest.
	The verification of significant intersections by either independent or alternative company personnel.	Not applicable.

Criteria	JORC Code Explanation	Commentary
Verification of sampling and assaying	The use of twinned holes.	Not applicable.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All data have been entered into Excel spreadsheets and subsequently into an Access database.
	Discuss any adjustment to assay data.	No adjustments have been performed to the data presented herein.
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.	Sample locations were recorded using a hand-held GPS with ± 3 metre accuracy.
	Specification of the grid system used.	MGA94 Zone 53.
	Quality and adequacy of topographic control.	Handheld GPS only.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Not applicable.
	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.	Not applicable.
	Whether sample compositing has been applied.	Surface samples were generally composites of a number of random sub samples collected at various points within an outcrop.
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.	Geological structure is poorly understood due to poor outcrop.
	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.	Not known.
Sample security	The measures taken to ensure sample security.	Samples were hand carried directly to LabWest by HRE.
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	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.	Exploration licences EL33101 and EL33194 that make up the Duke project are located 50 kilometres north-west of Tennant Creek in the Northern Territory (Figure 1). They consist of 38 and 45 graticular blocks respectively, occupying a total area of 255 km^2. They are situated on the Phillip Creek pastoral lease (NT Portion 408). The registered holder of the tenements is Heavy Rare Earths Limited (HRE). Full native title rights have been granted over the tenements and surrounding lands to people collectively represented by the Warlmanpa Warumangu Aboriginal Corporation, with whom cultural heritage surveys are undertaken 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.	The tenements are in good standing. There are no impediments to operating on the tenements other than requirements of the Northern Territory Department of Industry, Tourism and Trade (DITT).
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The previous exploration of most relevance to the Duke project was undertaken by Rum Jungle Uranium (RJU) on EL24835 in 2007-2012, and Manto Mining (Manto) on EL28904 in 2012-2022. RJU's primary targets were iron oxide Cu-Au-U (IOCGU) and unconformity-type U deposits. They drilled 28 holes, including diamond drill hole PCRD001, collected numerous rock chip and lag samples, flew 2 airborne magnetic/radiometric surveys and completed several ground gravity surveys. Manto similarly explored the region for IOCGU deposits, completing airborne magnetic/radiometric surveys and limited ground reconnaissance/prospecting. No holes were drilled by Manto during the period of tenure. More generally, the Independent Geologist (IG) retained by HRE to author an Independent Geologist's Report (IGR) for the Initial Public Offering of shares in HRE endeavored to find, report and review all previous exploration on or around the Duke project. This work spanned 60 years on ~22 programs involving some ~30 exploration companies, and was principally for gold, copper and uranium. None of the previous exploration targeted REEs and is therefore incidental to HRE's purposes. That exploration was described in the Section 14 of the IGR.

Criteria	JORC Code Explanation	Commentary
Geology	Deposit type, geological setting and style of mineralisation.	**Geology details**: The geology of the Duke project area is described in Section 13.5 of the IGR, and the deposit type, geological setting and style of mineralisation is described in the Section 15.1 and elsewhere. **Deposit type**: The REE deposit type postulated for the Duke project is the "Browns Range-style" – a "vein-style" breccia-hosted hydrothermal xenotime HREE mineralised system. This vein REE deposit type is described in Section 5.9 of the IGR, and is based on REE deposits at Browns Range just inside WA on the NT border. This vein REE deposit may also be a new REE deposit type know as an "unconformity-related REE deposit" as the REE mineralisation occurs in structures near unconformities. **Geological setting**: The important basis for the Duke project geological location is its position in Tennant Creek Region sedimentary and meta-sedimentary rocks which are closely analogous to similar age rock types in the Tanami Region to the west which hosts Browns Range. At both Browns Creek and Duke these rocks sit above a large granite dome and the meta-sedimentary rocks are unconformably overlain by younger sediments. The meta-sediments at Browns Range are cut by numerous vein-like granitic, syenitic and pegmatitic intrusions. The REE deposits at Browns Creek are characterised as breccia-hosted hydrothermal systems. **Mineralisation style**: The Browns Range REE deposits are dominated by xenotime (an yttrium phosphate mineral generally enriched in HREEs). It is therefore argued that, for the formation of the Browns Range REE deposits in the "Unconformity-related REE Deposit" style, the host sediments should be rich in phosphorus (such as apatite). The style does not require an igneous source (although the Warrego Granite is mapped within HRE's Duke tenements. It is not yet known if sediments within the Duke tenements are P-rich. **Vein setting**: The Brown's Range deposits contain xenotime found in narrow steeply dipping intrusive breccia-hosted hydrothermal systems, or "veins". These systems are controlled by faults, often conjugate sets, with deposits often found at intersections. NT Geological Survey mapping around the Duke project shows multiple faults and many previous explorers mention the presence of dolerite sills and dykes as well as lamprophyre sills and dykes – their intrusion controlled by local faults and shears. The area therefore has the structural potential for the formation of veins and pegmatites, and thus potentially for REE deposits.

Criteria	JORC Code Explanation	Commentary
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 data relevant to rock chip and drill core sampling for assay is shown in Table 2. Previous exploration and drilling on and around HRE's Duke tenements were completed in numerous programs by numerous explorers over 60 years. That historical drill hole data is described by exploration program in Section 14 of the IGR. Descriptions include program objectives, drilling details, many illustrations, and summary results.
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 are summed to produce a total rare earth (TREE) grade for each assay sample. No minimum grade cut-off has been adopted. No high cut-off has been applied.
	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.	Specifics are generally unknown from previous exploration and currently irrelevant to the Duke project.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values were necessary or used.
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').	Geometry of mineralization with respect to drill hole angles: Generally unknown from previous exploration and currently irrelevant to the Duke project. Down-hole reporting basis – down-hole: Generally unknown from previous exploration and currently irrelevant to the Duke project.
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 Figure 2 for plan view of the approximate location of rock chip sample sites, historical drilling and planned soil samples. Previous exploration was illustrated with plans in Section 14 of the IGR. Many program maps were extracted from the STRIKE online mapping facility provided by the DITT, referencing modern geology and location coordinates.

Criteria	JORC Code Explanation	Commentary
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.	Previous exploration was comprehensively reported in the IGR in sufficient detail relevant to the nature of a review. Each incidence of exploration was reported with approximately the same detail and weight. Reporting of outlier grade results was particularly avoided to facilitate balanced reporting – and the subdued nature of the mineralisation generally discouraged this anyway.
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.	The IGR endeavored to report all aspects of previous exploration at Duke.
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). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	HRE plans to infill and/or drill test anomalous results from the current program of soil sampling at Duke.