ASX ANNOUNCEMENT
Heavy Rare Earths Limited (ASX: HRE)
30 October 2024

RECONAISSANCE SAMPLING HIGHLIGHTS POTENTIAL FOR RARE EARTHS AND SCANDIUM AT RADIUM HILL

- **Assays of uranium mineralization from Radium Hill return highly elevated rare earths (up to 3.6% TREO) and scandium (up to 1081 ppm Sc_2O_3)**
- **HRE recently announced the acquisition of an 80% initial interest in uranium rights on a highly significant land package in South Australia's Curnamona Province, including the Radium Hill Project**
- **These mineral rights extend to rare earths and scandium at Radium Hill**
- **Rare earths were first recognised at Radium Hill in 1908**
- **Academic studies of Radium Hill mineralization have recorded values of up to 7% REE[1][2] and 3000 ppm Sc[3]**
- **2.6 million lbs @ 0.12% (1,200 ppm) U_3O_8 was mined at Radium Hill between 1954 and 1961**

Heavy Rare Earths Limited ("**HRE**" or "**the Company**") announces assay results from initial reference sampling at its Radium Hill project in South Australia. The Company recently announced it had acquired an 80% initial interest in the uranium rights on three projects from Havilah Resources Limited (Figure 1) *(refer to ASX announcement 21 October 2024)*. These rights extend to rare earths (REE) and scandium (Sc) at Radium Hill.

Samples were analysed to test the potential for REE and Sc in uraniferous Radium Hill lode-style mineralization. These lodes are known to extend from the historic Radium Hill mine for at least 7 kilometres in a northeast direction to Bonython Hill (Figure 2). A total of five samples were collected from historic dumps, both within the historic Radium Hill Mine site, which is excluded from HRE's Radium Hill project, and from lode extensions which are in the project area.

Mining at Radium Hill first occurred in 1908 with the main phase of mining taking place between 1954-1961. Although the main focus of mining was on production of uranium, the presence of significant quantities of rare earths have been known from the earliest stages.

[1] Gatehouse, B. M., Grey, I. E., Kelly, P. R., 1979. The crystal structure of davidite. *American Mineralogist*, Volume 64, pages 1010-1017.
[2] Radcliff, S., 1913. The extraction of radium from the Olary ores. *Journal and proceedings of the Royal Society of New South Wales*, 47, 145–156.
[3] Mossman D. J., 1985. Davidite; a review of Canadian occurrences, and report on a recent find at Kommes Lake, Saskatchewan. *The Canadian Mineralogist*, 23 (3): 495–500.

Soon after discovery of Radium Hill in 1906, the famous geologist, Antarctic explorer and academic Sir Douglas Mawson, described a previously unknown uranium mineral which he named 'davidite' and noted the new mineral contains *"a notable amount of rare earths, uranium, vanadium, and chromium"*.[4]

During the main mining phase when 2.6 million lbs of U_3O_8 were mined, there was no attempt to extract rare earths or other metals until the last stages of the operation when a solvent extraction plant was constructed on the site by AMDEL (1960-62). This plant produced mainly scandium with some yttrium oxide (Y_2O_3) and other rare earth oxides although production figures are unclear and ore assays unavailable.

Of the five samples in the current program, three (samples RH-1, RH-2, RH-C) were collected from ore dumps adjacent to the historic Radium Hill processing plant, one (RH-B) from a dump adjacent to a historic shaft at Radium Hill North and another (RH-A) from a stockpile at Bristowe's prospect. Sampling was designed to confirm historic reports of rare earths, scandium and other elements in Radium Hill-style uraniferous lode mineralization.

Assay results returned significant values for all five samples (Table 1).

Table 1: Radium Hill reference sample assays

ID	U3O8 ppm	V2O5 ppm	Sc2O3 ppm	La2O3 ppm	CeO2 ppm	Pr6O11 ppm	Nd2O3 ppm	Sm2O3 ppm	Eu2O3 ppm	Gd2O3 ppm	Tb4O7 ppm	Dy2O3 ppm	Ho2O3 ppm	Er2O3 ppm	Tm2O3 ppm	Yb2O3 ppm	Lu2O3 ppm	Y2O3 ppm	TREO ppm
RH-A	**59**	7034	**1081**	509	641	56	162	28	5	25	4	19	5	13	2	17	3	114	**1602**
RH-B	**2476**	7712	**468**	3471	3120	180	360	68	13	131	36	321	85	316	56	409	63	2222	**10853**
RH-C	**4233**	4713	**391**	5184	4557	288	629	121	25	178	51	433	109	401	77	578	88	2083	**14800**
RH-1	**5684**	6819	**606**	3108	2531	151	314	79	18	182	57	518	143	548	104	791	123	3505	**12171**
RH-2	**16273**	10604	**452**	13604	13635	777	1400	194	34	312	75	604	162	630	120	935	156	3734	**36371**

In addition to uranium, it is apparent there are high concentrations of scandium and rare earths in these davidite-bearing samples which confirms the historic observations. The Company emphasises that these samples were collected and assayed for the purpose of checking the concentrations of metals associated with uranium in order to ascertain the validity of previous scant literature reports. These sample results are not purported to be representative of the mineralization in the region, which would require systematic sampling, including drilling and/or costeaning, to reach any firm conclusions. However, the associated metal results are sufficiently encouraging to warrant detailed follow up and inclusion in the Project's future assay protocols and metallurgical treatment considerations.

[4] Mawson, D., 1906. On certain new mineral species associated with carnotite in the radio-active ore body near Olary. *Transactions and Proceedings of the Royal Society of South Australia*, 30, 188–193.

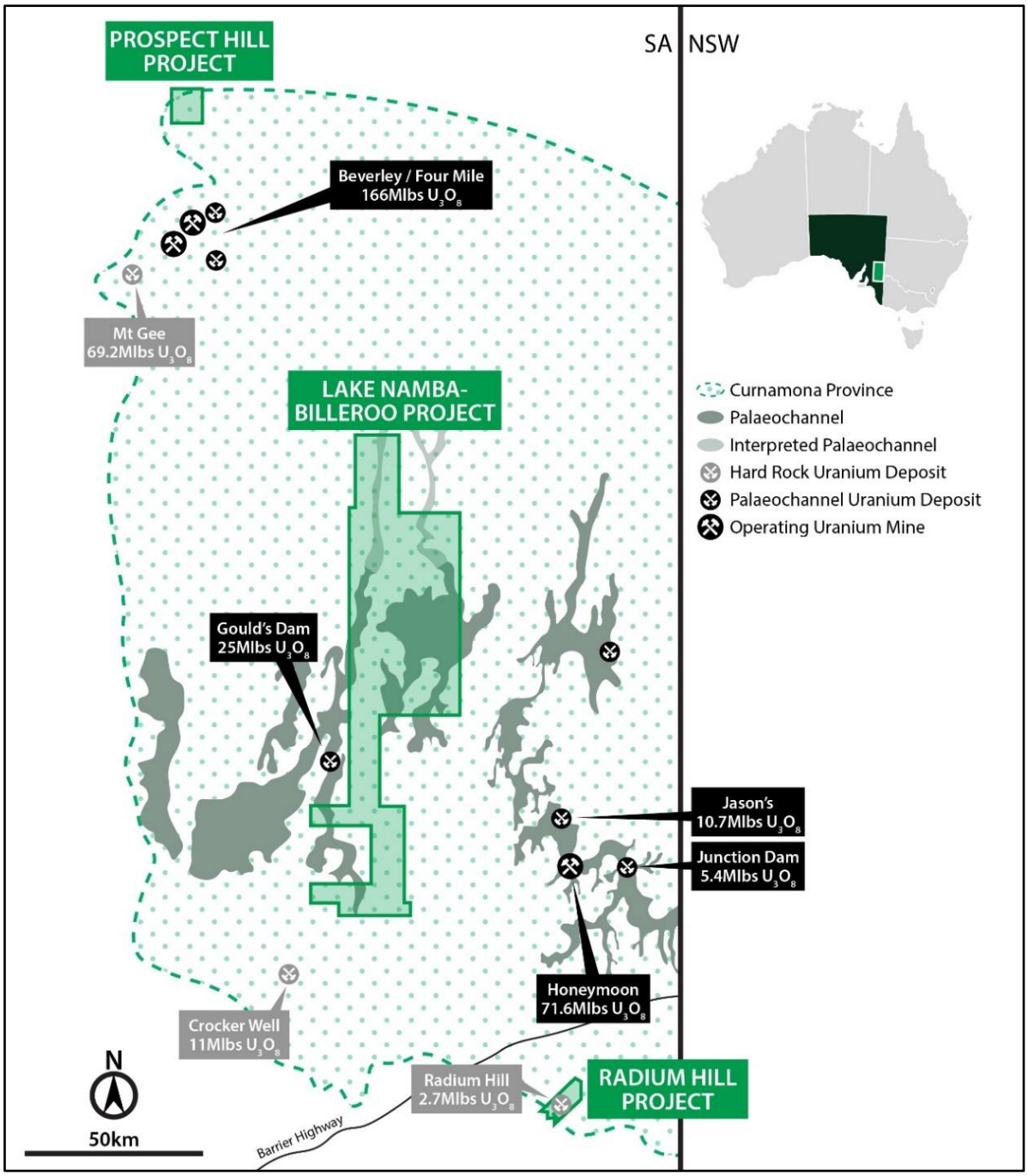

Figure 1: Location of HRE project areas and uranium deposits[5] in the Curnamona Province of eastern South Australia.

[5] *Data sources:*
- Boss Energy Ltd (ASX: BOE) Annual Report 2024.
- Marmota Limited (ASX: MEU) ASX announcement 26/10/2023: "Marmota to grow Junction Dam uranium resource".
- SARIG SA Geodata MINDEP Database https://drillhole.pir.sa.gov.au/MineralDepositDetails.aspx?DEPOSIT_NO=962.
- Wilson T 2015. Uranium and uranium mineral systems in South Australia – Third edition, Report Book 2015/00011. Department of State Development, South Australia, Adelaide.
- World Nuclear Association: https://world-nuclear.org/information-library/appendices/australia-s-uranium-mines.

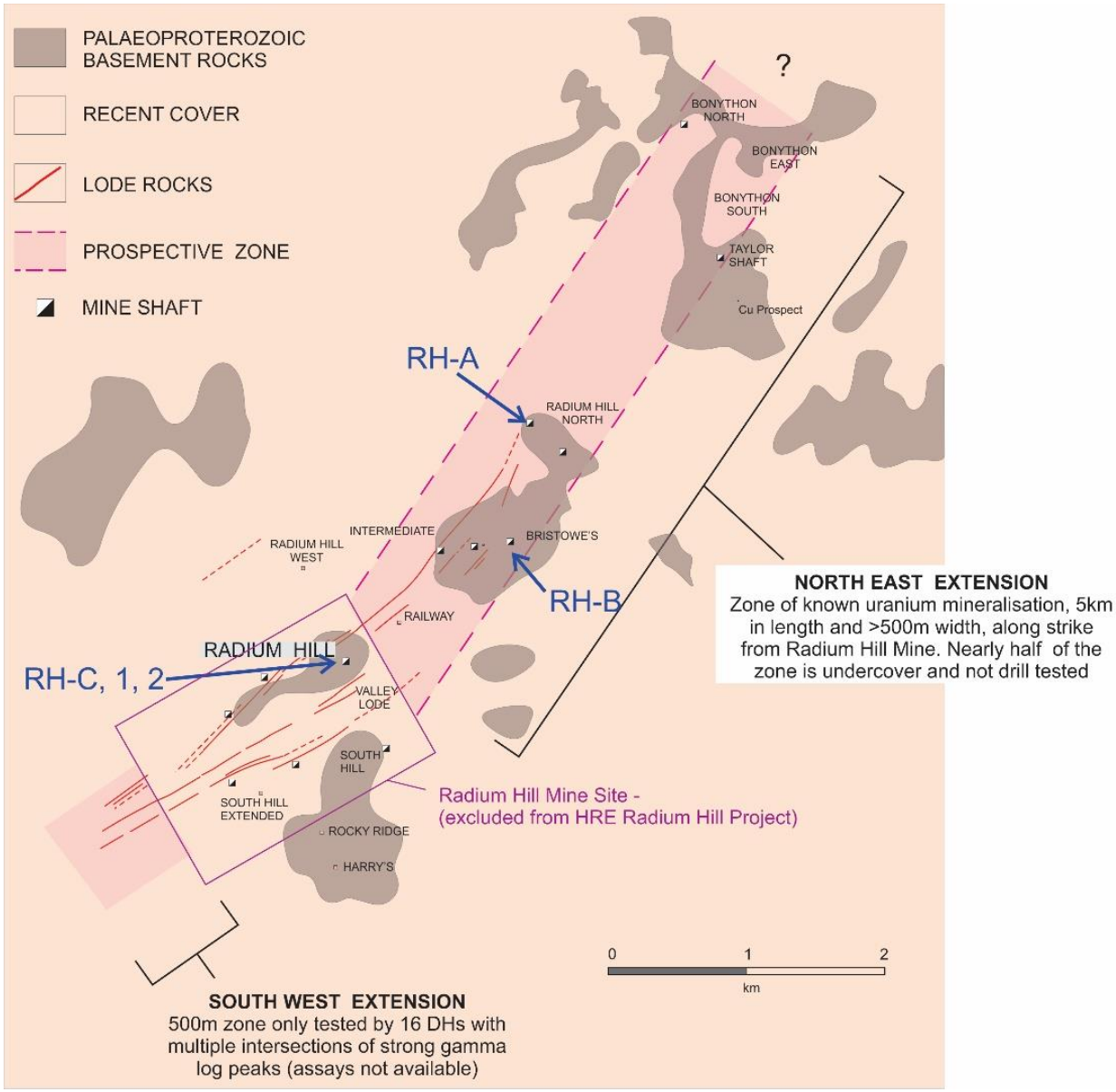

Figure 2: Radium Hill Project – location of reference sampling.

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This announcement has been approved by the Board of HRE.

For more information, please contact:

Executive Director
Richard Brescianini
info@hreltd.com.au

Media Enquiries
Ryan Batros
info@brcapital.com.au

About Heavy Rare Earths Limited

Heavy Rare Earths Limited (ASX: HRE) is an Australian uranium and 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 an 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 Person's Statement

The Exploration Results contained in this announcement were compiled by Mr Joseph Ogierman, consultant geologist. Mr Ogierman is a Member (#4469) of the Australian Institute of Geoscientists. He has more than 35 years' experience in mineral exploration and has sufficient experience relevant to the style of mineralization and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 JORC Code. Mr Ogierman consents to the inclusion in this announcement of the matters based on the Exploration Results in the form and context in which they appear.

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.* *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* *Aspects of the determination of mineralization that are Material to the Public Report.*	• A total of 5 rock samples were collected as grab samples from existing historic mining and exploration workings both within EL 6041 and from the historic Radium Hill Mine site, a 2.64 km^2 area reserved from the South Australian *Mining Act 1971*. This reserved area is enclosed within EL 6041 but excluded from the exploration licence. • Samples were taken from sites such as mine dumps, prospect pits and trenches, and adjacent mineralised outcrop or subcrop/float. Equipment used was predominately handheld hammer for the collection of rock fragments.
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.).*	• No drilling was undertaken on the property.
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.* *Measures taken to maximize sample recovery and ensure representative nature of the samples.* *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• No drilling was undertaken on the property.

Criteria	JORC Code Explanation	Commentary
Logging	*Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.* *The total length and percentage of the relevant intersections logged.*	• No drilling was undertaken on the property.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.* *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.* *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* *Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.* *Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.* *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• No drilling was undertaken on the property. • All rock grab samples were approximately 200 - 500 grams in weight. • No subsampling is described in rock grab samples. • No field of duplicate sampling was undertaken. • Sample sizes were appropriate for the material sampled.

<table>
<tr><th>Criteria</th><th>JORC Code Explanation</th><th>Commentary</th></tr>
<tr><td>Quality of assay data and laboratory tests</td><td>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.
For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.
Nature of quality control procedures adopted (e.g., standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e., lack of bias) and precision have been established.</td><td>• The nature of the analyses is appropriate to the nature of mineralization. Analyses were complete by the Adelaide laboratory of Bureau Veritas Minerals Pty Ltd (BV).
• The assay technique used by BV is by ICP-OES with Lithium Borate Fusion using method LB101 for Al, Ba, Be, Cr, Fe, K, Mg, Mn, Na, P, Sc, Si, Ti and V. Method LB102 was used with ICP-MS for Bi, Co, Cs, Ga, Ha, In, Mo, Nb, P, Rb, Re, Sb, Se, Sn, Sr, Ta, Te, Tl, U, W, Y, Zr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.
• An aliquot of sample is accurately weighed and fused with lithium metaborate at high temperature in a Pt crucible. The fused glass is then digested in nitric acid.</td></tr>
<tr><td>Verification of sampling and assaying</td><td>The verification of significant intersections by either independent or alternative company personnel.
The use of twinned holes.
Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.
Discuss any adjustment to assay data.</td><td>• This report does not include drilling or drilling results.</td></tr>
<tr><td>Location of data points</td><td>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.
Specification of the grid system used.
Quality and adequacy of topographic control.</td><td>• This report does not include drilling or drilling results.
• Grab sample locations were recorded using a hand-held Garmin Etrex 22x GPS with ±3 metre accuracy. The grid system used is GDA94 Zone 54.
•
<table>
<tr><th>Sample ID</th><th>Northing (m)</th><th>Easting (m)</th><th>Elevation (m ASL)</th></tr>
<tr><td>RH-A</td><td>6422761</td><td>467360</td><td>257</td></tr>
<tr><td>RH-B</td><td>6422639</td><td>467334</td><td>256</td></tr>
<tr><td>RH-C</td><td>6420965</td><td>465480</td><td>257</td></tr>
<tr><td>RH-1</td><td>6421018</td><td>465645</td><td>257</td></tr>
<tr><td>RH-2</td><td>6421131</td><td>465780</td><td>256</td></tr>
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Criteria	JORC Code Explanation	Commentary
Data spacing and distribution	*Data spacing for reporting of Exploration Results.* *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* *Whether sample compositing has been applied.*	• Data spacing is appropriate for the style of geological reconnaissance and rock characterisation.
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* *If the relationship between the drilling orientation and the orientation of key mineralized structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Orientation is not considered in this reconnaissance style of rock sampling, where samples were collected from historical ore dumps and mine pits.
Sample security	*The measures taken to ensure sample security.*	• Samples were hand-delivered to the BV laboratory in Adelaide by HRE's consultant.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	• No audits or review of the sampling techniques and results from the exploration program have been performed.

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.* *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 Radium Hill Project covers 57 km^2, within which there is a 2.64 km^2 area covering the historic Radium Hill Mine and Tailings Dam, which is reserved from the South Australian *Mining Act 1971*. • Heavy Rare Earths Limited (HRE) has entered into a binding Term Sheet with Havilah Resources Limited (Havilah) to acquire an initial 80% interest in the uranium rights on all or part of 22 tenements in South Australia, including parts of 4 tenements at Radium Hill. Thereafter HRE and Havilah will co-fund exploration and development activities under a joint venture arrangement. • The Term Sheet excludes access to the 2.64 km^2 area over the historic Radium Hill uranium mine (Radium Hill Mine Exclusion Zone). This area is administered by the South Australian Government. • Havilah will remain the title holder of each tenement and HRE as operator will work with Havilah on all tenement governance matters including annual technical reporting, tenement administration and heritage access agreements. • A program for environment protection and rehabilitation (PEPR) approval from the South Australian Department for Energy and Mining (DEM) will be required to undertake ground disturbing works. • Havilah has Native Title Mining Agreements (NTMA) in place with all the relevant Native Title parties covered by the tenements and these NTMAs are registered with DEM.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	• Exploration at Radium Hill was undertaken solely by the SA Department of Mines in the years up to 1962. Exploration in the specific project area by private companies has only reviewed government data.

Criteria	JORC Code Explanation	Commentary
Geology	*Deposit type, geological setting and style of mineralization.*	• The Radium Hill area comprises a sequence of gneisses of late Palaeoproterozoic age (Willyama Supergroup), which was intensely deformed and metamorphosed by the Olarian Orogeny (ca. 1640–1580 Ma) and intruded by granitoid intrusives of early Mesoproterozoic age (ca. 1590–1580 Ma). Uranium mineralization occurs in NE-trending fractures and shears that cross-cut the regional banding in a domal NE-plunging anticlinal structure.
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.*	• ca. 670 diamond core drillholes drilled in the Radium Hill area of which ca. 190 drillholes were drilled within the Project area outside the Radium Hill Mine Exclusion Zone.

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.* *Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• This report does not include drilling or drilling results. Sample results are from individual samples, not subject to cutting of grades or compositing. • No metal equivalent values are reported. • All REE assays have been converted to oxide (REO) values using the following industry standard element-to-stoichiometric oxide conversion factors: La2O3 = La x 1.1728 CeO2 = Ce x 1.2284 Pr6O11 = Pr x 1.2082 Nd2O3 = Nd x 1.1664 Sm2O3 = Sm x 1.1596 Eu2O3 = Eu x 1.1579 Gd2O3 = Gd x 1.1526 Tb4O7 = Tb x 1.1762 Dy2O3 = Dy x 1.1477 Ho2O3 = Ho x 1.1455 Er2O3 = Er x 1.1435 Tm2O3 = Tm x 1.1421 Yb2O3 = Yb x 1.1387 Lu2O3 = Lu x 1.1371 Y2O3 = Y x 1.2699. These oxide values are summed to produce a total rare earth oxide (TREO) grade for each assay sample. • All Sc, U and V assays have been converted to oxide values using the following industry standard element-to-stoichiometric oxide conversion factors: Sc2O3 = Sc x 1.5338 U3O8 = U x 1.1792 V2O5 = V x 1.7852.

Criteria	JORC Code Explanation	Commentary
Relationship between mineralization widths and intercept lengths	*If the geometry of the mineralization 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').*	• Mineralization at Radium Hill is subvertical to steeply SE dipping. Reported intercepts in costeans are believed to represent the true thickness of mineralization but drillhole intercepts are believed to be greater than true thickness (true width is not known but may be ca. 50-75% of intercepts).
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.*	• No new discoveries are being reported here. • Maps and tables shown in body of report.
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.*	• Due to the large number of historic exploration drillholes in the Project area, it is impractical to present a comprehensive report of such. Historic exploration data was often classified and there is often very little information except for uranium intercepts mentioned in brief summary texts or on maps and sparse sections.
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 majority of exploration within the Project areas has been costeaning and drilling but also includes multiple government and company geophysical surveys including airborne electromagnetics, magnetics, radiometrics, and ground gravity, to map out geological basement structure. The majority of these surveys were completed prior to 1962. • Metallurgical work was undertaken at Radium Hill prior to and during mining from 1954-61. This is not considered material at this stage of investigation.

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).* *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Full compilation of available historical geological and geochemical data, magnetic and radiometric interpretations, geological mapping and more comprehensive rock chip sampling is planned. • Exploration consisting of geological mapping in conjunction with scintillometer and hand-held XRF sample analysis is planned. • Detailed aerial magnetic and radiometric surveys of the northeast extension of the Radium Hill lodes is planned from the Radium Hill Mine to Bonython Hill.