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25 October 2023

Maiden Mineral Resource Estimate at Lyons Project

- **Inferred Resource of 1Mt @ 0.32% TREO from the Mineralised Ironstones at Lyons 11, 12 & 13**
- **Combined NdPr grade of 0.13%**
- **Niobium grade at Lyons 12 & 13 of 0.23% Nb_2O_5**

Lanthanein Resources Ltd ("Lanthanein" or the "Company") is please to announce the Maiden Mineral Resource Estimate (MRE) for the Lyons 11, 12 & 13 Prospects at the Gascoyne Rare Earth Elements (REE) Project. Following on from the initial RC drilling last year and an infill RC programme this season, sufficient data points were generated to complete this initial Inferred MRE.

Mineral Resource Estimate

The Mineral Resource Estimate (**MRE**) for the Lyons REE Project stands at 0.99 million tonnes at 0.32%TREO (Total Rare Earth Oxides) as detailed in Table 1 and Appendix 1. Cross sections and plans illustrating the Mineral Resource are presented in Appendix 2.

Table 1: Inferred Mineral Resources at Lyons above 0.2% TREO

Area	Tonnes (Mt)	TREO (%)	NdPr (%)	Nb_2O_5 (%)	TREO (t)
Lyons 12&13	0.69	0.33	0.15	0.23	2,266
Lyons 11	0.30	0.32	0.10		670
Total	**0.99**	**0.32**	**0.13**		**3,221**

Tonnages are dry metric tonnes. Minor discrepancies may occur due to rounding.

Summary of Resource Estimation Parameters

As per ASX Listing Rule 5.8 and the 2012 JORC Code, a summary of the material information used to estimate the Mineral Resource is detailed below. Further details can be found in Appendix 2.

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Geology & Geological Interpretation:

REE mineralisation is related to the intrusion of the Gifford Creek Carbonatite Complex (GCCC) into the Durlacher Supersuite (including Yangibana and Pimbyana Granites) and the Pooranoo Metamorphics. The c.1360 Ma GCCC is composed of NW striking Lyons River Sills (calcio-,magnesio- and ferrocarbonatites), NE striking fenite (alteration) veins, the Yangibana Ironstones (which host the REE mineralisation) and magnetite-biotite dykes. Carbonatites in the region are thought to have been generated from melting of the Glenburgh Orogen-fertilized mantle during reactivation of structures (e.g. Lyons River Fault) at c. 1370 Ma followed by magma ascent along the same structures.

The geological interpretation focussed on sectional interpretation of the Yangibana Ironstones followed by wireframing into a 3D solid. Based on outcrop and drilling intersections the ironstones dip shallowly at between 20 and 40 degrees. At Lyons 12&13 the ironstones strike to the northwest and at Lyons 11 the ironstones strike to the east (or ENE). The interpretation assumed a simple planar body and did not incorporate any undulation of the ironstone unit or fault offsets. A minimum intersection of 2 metres downhole was used.

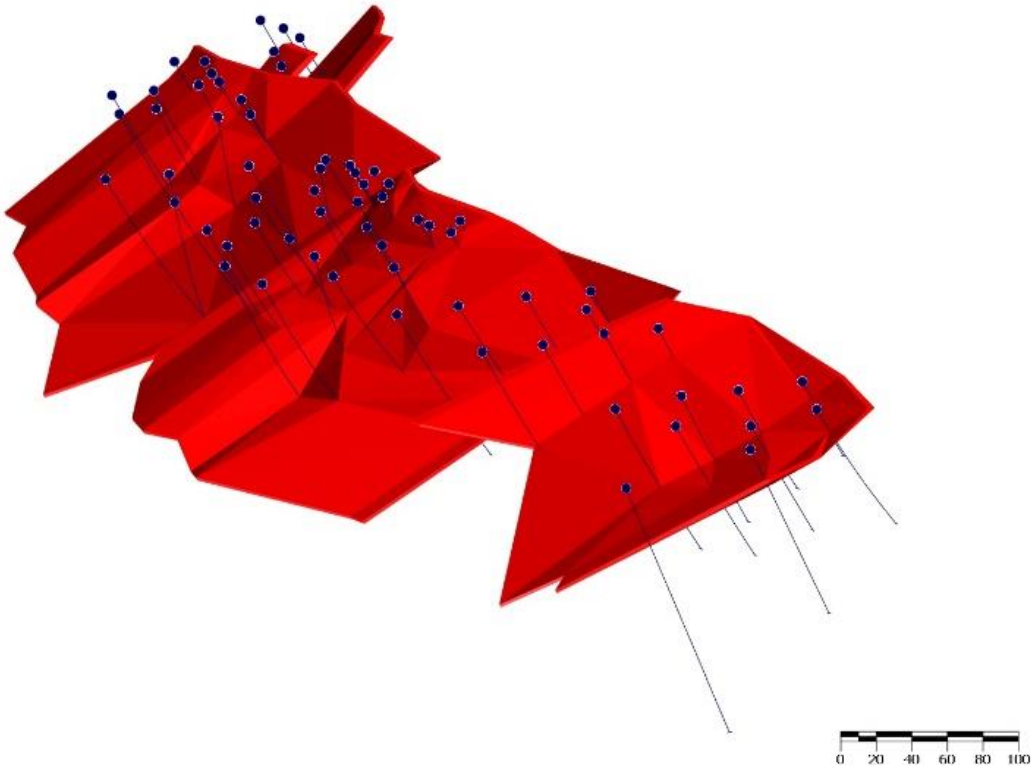

Figure 1: Oblique view looking NW showing wireframed interpretation of ironstone unit at Lyons 12&13

Drilling, Sampling and Sub-sampling Techniques:

A total of 89 drillholes for 6,373 metres of drilling informed the model. Of these 66 holes for 4,639 metres were drilled at Lyons 12-13 and 23 holes for 1,734 metres were drilled at Lyons 11. All drilling was carried out by Lanthanein Resources in 2022 and 2023 using standard RC drilling techniques, with a bit size of 5.5 inches. From every metre drilled a 2-3km sample (split) was sub-sampled into a calico bag via a Metzke cone splitter.

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Sample Analysis:

All samples were submitted to ALS Laboratories in Perth for determination of Rare Earth Oxides by Lithium Borate Fusion XRF. The 2-3kg samples were oven dried to 105^{o}C and pulverised to 85% passing 75um to produce a 0.66g charge. The charge is fused with 12:22 lithium borate flux containing an oxidising agent, and poured to form a fused disk. The resultant disk is then analysed by XRF spectrometry specifically for Rare Earths (ALS Method ME-XRF30). QAQC in the form of duplicates and CRM's (OREAS Standards 460, 461 and 465) were inserted at a rate of 1:50 samples. Blank samples were inserted at a rate of 1:50 samples. Additionally, within mineralised zones, a standard and a blank were inserted.

Estimation Methodology:

Grade estimation using Ordinary Kriging (OK) was undertaken using Surpac software. Detailed statistical and geostatistical investigations have been completed on the captured estimation data set (1m samples). This includes exploration data analysis, boundary analysis and grade estimation trials. The variography applied to grade estimation has been generated using Snowden Supervisor. These investigations have been completed on the ore domain and above-ore domain separately. KNA analysis has also been conducted in Snowden Supervisor in various locations on the ore domain to determine the optimum block size, minimum and maximum samples per search and search distance.

Four parameters, TREO, NdPr, Nb_2O_5 and P, were estimated using parent cell estimation, with density being assigned by lithology. Only TREO, NdPr and Nb_2O_5 were used for reporting, with Nb_2O_5 not reported for Lyons 11 due to insufficient data. Drill hole data was coded using three dimensional domains reflecting the geological interpretation. One metre composited data was used to estimate the domains. The domains were treated as hard boundaries and only informed by data from the domain. A parent cell size of 10m E by 10mN by 4m RL was selected, which was sub-blocked down to 2.5m E by 2.5m N by 1m RL (to ensure adequate volume representation).

The search pass for the estimation run used an ellipsoid oriented along the strike of the ironstones with a minimum of 8 samples and a maximum of 22 samples and a range matching the variography.

Mining & Metallurgical Methods and Other Factors:

The Lyons Project is located adjacent to the Yangibana REE deposit, owned by Hastings Technology Metals Ltd (ASX.HAS, **Hastings**). This is an advanced project which has completed a Definitive Feasibility Study and is advancing to construction. Mineralisation at Yangibana is hosted in the same Yangibana Ironstones which hosts mineralisation at Lyons and accordingly at this early stage of exploration it is assumed that the mining and metallurgical factors from Yangibana represent an appropriate starting point for Lyons. For a higher classification of Mineral Resource or for any mining/economic study further work will be required to confirm that these assumptions are in fact applicable.

The Resource model assumes open cut mining is completed and a moderate level of mining selectivity is achieved in mining. The difference in hardness and colour between the ironstones and the country rock supports the practicality of this assumption. It has been assumed that grade control will be applied to ore/waste delineation processes to ensure adequate coverage of the mineralisation zones. No assumptions have been made regarding metallurgical factors other the above.

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Classification & Cut-off Grade:

The cut-off grade of 0.2% TREO for the stated Mineral Resource estimate is determined from economic parameters and reflects the current and anticipated mining practices and processing requirements. Reference has been made to the adjacent Yangibana Deposit to confirm these assumptions.

The Mineral Resource has been classified as Inferred due to the spacing of the drilling completed, specifically the number and density of higher grade intersections, as well as the early stage of the project. The classification is based on the confidence levels of the key criteria as presented in the table below.

Items	Discussion	Confidence
Drilling Techniques	RC drilling was performed with a face sampling hammer (bit diameter 5.5 inches) and samples were collected using a cone splitter at 1m intervals.	Moderate/High
Logging	Standard nomenclature has been adopted. Some inconsistencies between different geologists. It is recommended that more detailed logging of weathering is carried out and verified in future.	Moderate
Drill Sample Recovery	Recoveries are not recorded in the entire database but no sample recovery issues were noted.	Moderate
Sub-sampling Techniques and Sample Preparation	Standard sub sampling and sample preparation techniques used.	Moderate/High
Quality of Assay Data	Acceptable quality control procedures utilised.	Moderate/High
Verification of Sampling and Assaying	Primary data is stored in Excel datasheets. Upon import to modelling software only minor validation errors occurred and were able to be rectified. No twin holes have been drilled. Sampling and assaying procedures have been assessed and are considered appropriate industry standards.	Moderate/High
Location of Sampling Points	Survey of all collars conducted with adequate survey equipment. Topography Surface versus Collar highlights minor discrepancies, not believed to be significant at this early stage.	Moderate
Data Density and Distribution	Majority of mineralisation defined on sections spaced between 20 and 40m apart. Holes spaced 30-40m apart on each section.	Moderate
Audits or Reviews	N/A	N/A
Database Integrity	Collar, Lithology & Assay certificates have been partially verified, and no issues were identified.	Moderate
Geological Interpretation	Interpretation of ironstone units is believed to be robust based on the drill spacing. Only lithological control applied to mineralisation, closer spaced drilling may identify other controls to be incorporated into future resource estimates.	Moderate/High
Estimation and Modelling Techniques	Ordinary Kriging is considered to be appropriate, given the geological setting and grade distribution. Multiple elements were estimated to enable validation.	Moderate
Cut off Grades	OK is independent of cut-off grade as the mineralisation constraint was based on lithology. A 0.2% TREO lower cut-off grade is considered appropriate for reporting.	Moderate
Mining Factors	Not Applied	N/A

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Items	Discussion	Confidence
Metallurgical Factors	Not Applied	N/A
Tonnage Factors (In-situ Bulk Densities)	Limited density information. It is recommended further measurements are completed ahead of any future resource update.	Low/Moderate

This announcement has been authorised for release by the Directors of the Company.

For additional information please visit our website at www.lanthanein.com

LANTHANEIN RESOURCES LTD

Competent Person's Statement

The information in this press release relating to Mineral Resources is based on information compiled, reviewed and assessed by Mr. Bill Oliver, who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr. Oliver is a consultant to the Company and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code**). Mr. Oliver consents to the inclusion of the information in the form and context in which it appears.

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Appendix 1. Mineral Resource Statement for Ironstone-hosted REE mineralisation at Lyons

Area	Tonnes (Mt)	TREO (%)	NdPr (%)	Nb_2O_5 (%)	TREO (t)
Lyons 12&13	0.69	0.33	0.15	0.23	2,266
Lyons 11	0.30	0.32	0.10		670
Total	**0.99**	**0.32**	**0.13**		**3,221**

Tonnages are dry metric tonnes. Minor discrepancies may occur due to rounding.

Sensitivity to cut-off grade is presented in the table below:

Cut-off Grade	Tonnes (Mt)	TREO (%)	TREO (t)
0.00	2.23	0.21	4,774
0.05	2.18	0.22	4,759
0.10	1.86	0.24	4,502
0.15	1.41	0.28	3,944
0.20	0.99	0.32	3,221
0.25	0.75	0.36	2,677
0.30	0.52	0.40	2,049
0.35	0.34	0.43	1,470
0.40	0.21	0.48	981

Plans and cross sections illustrating the Mineral Resource are included in Appendix 2.

Supporting information as prescribed by the JORC Code is included in Appendix 3.

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Appendix 2.

The following images are presented to illustrate the Mineral Resource Estimate at Lyons.

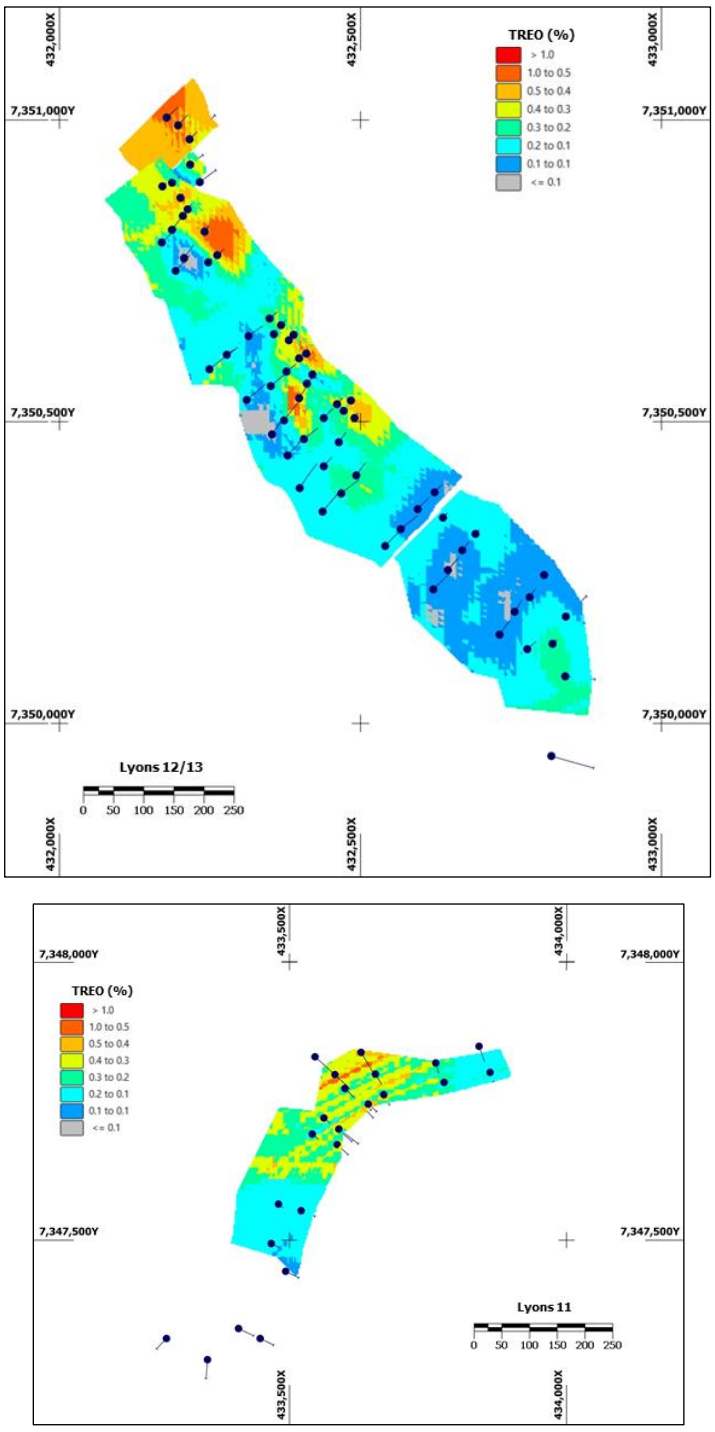

Figure A1: Plans showing resource model at Lyons 12&13 (top) and Lyons 11 (bottom)

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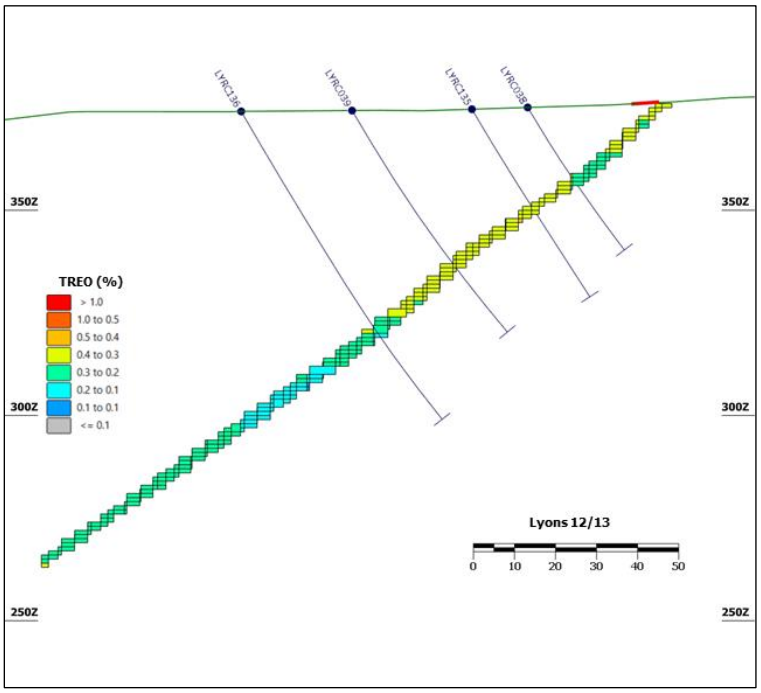

Figure A2: Cross Section showing resource model at Lyons 12&13

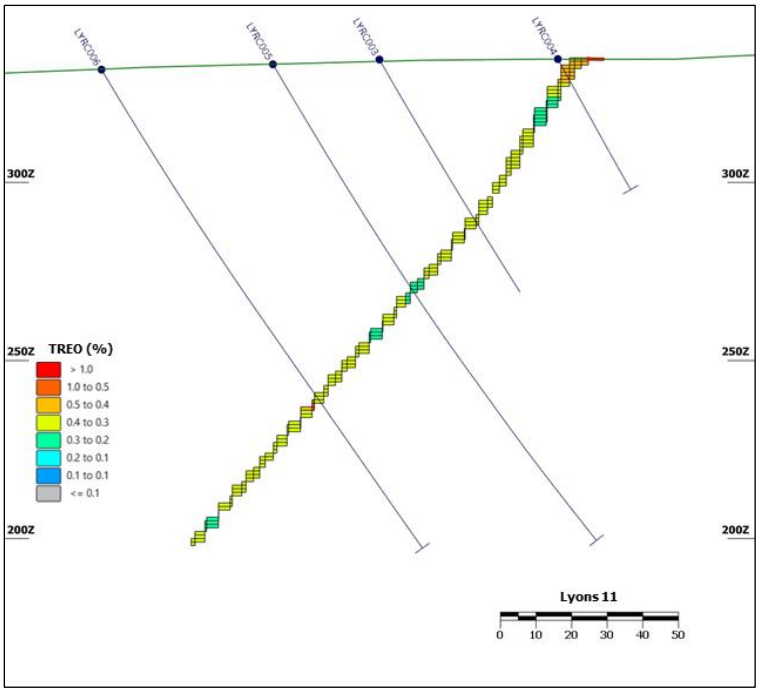

Figure A3: Cross Section showing resource model at Lyons 12&13

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Appendix 3. The following tables are provided to ensure compliance with JORC Code requirements for the reporting of Mineral Resources

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 (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	Reverse Circulation (RC) drilling was undertaken to produce samples for assaying. Two sampling techniques were utilised for this program, 1m metre splits directly from the rig sampling system for each metre and 3m composite sampling from the spoil piles. Samples submitted to the laboratory were determined by the site geologist. **1m Splits** From every metre drilled a 2-3km samples (split) was sub-sampled into a calico bag via a Metzke cone splitter from each metre of drilling. All samples are submitted to ALS Laboratories in Perth for determination of Rare Earth Oxides by Lithium Borate Fusion XRF (ALS Method ME-XRF30).
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	**RC Drilling** Topdrill undertook the program utilising a Schramm T685 wheel-mounted (8x8) drillrig with additional air from an auxillary compressor and booster. RC bit size was 5.5 inch.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have*	**RC Drilling** Drilling was undertaken using a 'best practise' approach to achieve maximum sample recovery and quality through the mineralised zones. Best practise sampling procedure included: suitable

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Criteria	JORC Code explanation	Commentary
	occurred due to preferential loss/gain of fine/coarse material.	usage of dust suppression, suitable shroud, lifting off bottom between each metre, cleaning of sampling equipment, ensuring a dry sample and suitable supervision by the supervising geologist to ensure good sample quality. At this stage, no known bias occurs between sample recovery and grade.
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.*	RC drill chips were logged by a qualified geologist with sufficient experience in the geological terrane and relevant styles of mineralisation using an industry standard logging system which could eventually be utilised within a Mineral Resource Estimation. Lithology, mineralisation, alteration, veining, weathering and structure were all recorded digitally. Chips were washed each metre and stored in chip trays for preservation and future reference. RC pulp material is also analysed on the rig by pXRF, scintillometer and magnetic susceptibility meter to assist with logging and the identification of mineralisation. Logging is qualitative, quantitative or semi-quantitative in nature.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate*	**RC Drilling** From every metre drilled, a 2-3kg sample (split) was sub-sampled into a calico bag via a Metzke cone splitter. QAQC in the form of duplicates and CRM's (OREAS Standards 460, 461 and 465) were inserted at a rate of 1:50 samples. Blank samples were inserted at a rate of 1:50 samples. Additionally, within mineralised zones, a standard and a blank were inserted.

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Criteria	JORC Code explanation	Commentary
	to the grain size of the material being sampled.	2-3kg samples are submitted to ALS Laboratories (Perth), oven dried to 105°C and pulverised to 85% passing 75um to produce a 0.66g charge for determination of Rare Earth Oxides by Lithium Borate Fusion XRF (ALS Method ME-XRF30). Standard laboratory QAQC is undertaken and monitored.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	**Laboratory Analysis** Lithium Borate fusion is considered a total digest and Method ME-XRF30 is appropriate for REE determination. Standard laboratory QAQC is undertaken and monitored by the laboratory and by the Company upon assay result receival. • All samples were submitted to ALS Laboratories in Wangara, Perth where 250g of RC sample were pulverised to better than 85% passing minus 75 micron. • A 66-gram aliquot of pulverised sample is fused with 12:22 lithium borate flux containing an oxidizing agent, and poured to form a fused disk. The resultant disk is then analysed by XRF spectrometry specifically for Rare Earths (ALS Method ME-XRF30) • Lithium borate fusion is considered a total digest and Method ME-XRF30 is appropriate for REE determination. • Standards, duplicates and blanks were submitted with RC samples every 50m and within mineralised ironstones. Airborne geophysical data including magnetics and radiometrics (eK, eTh, eU) were collected by MagSpec Airborne Surveys. The survey was flown with a Cessna 206 aircraft. Magnetic data was collected from a G-823A cesium vapour magnetometer using a 50m line spacing and 30m sensor height. Radiometric data was collected from an RSI RS-500 gamma-ray spectrometer of 32L

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Criteria	JORC Code explanation	Commentary
		Crystal Volume flown at 30m sensor height and 50m line spacing. All readings (X,Y,Z) were within a 2m accuracy. Traverse Line Direction was East-West.
Verification of sampling and assaying	• *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.*	**Logging and Sampling** Logging and sampling were recorded directly into a digital logging system, verified and eventually stored in an offsite database. Significant intersections are inspected by senior company personnel. No twinned holes have been drilled at this time. No adjustments to any assay data have been undertaken. Field data is entered into excel spreadsheets to be loaded into a database.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Collar position was recorded using a Garmin handheld GPS which has an accuracy of +/- 5m. • GDA94 Z50s is the grid format for all xyz data reported. Azimuth and dip of the drill hole was recorded after the completion of the hole using a Reflex TN-14 Azi Aligner and Axis north seeking Gyro. A reading was undertaken every 10^{th} metre with an accuracy of +/- 1^{o} azimuth and +/- 0.3^{o} dip.
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.*	See drill table for hole positions. Data spacing is suitable for Mineral Resource Estimation. Sample compositing has not been applied.
Orientation	• *Whether the orientation of sampling*	Drilling was undertaken at a near perpendicular

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Criteria	JORC Code explanation	Commentary
of data in relation to geological structure	*achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	angle to the interpretated strike and dip of the ironstone outcrops and modelled magnetic data. No sample bias is known at this time.
Sample security	• *The measures taken to ensure sample security.*	All geochemical samples were collected, bagged, and sealed by Gascoyne Geological Services staff and delivered to Bishops Transport in Carnarvon. Samples were delivered directly to ALS Laboratories in Wangara, Perth by Bishops Transport ex Carnarvon.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	The program is continuously reviewed by senior Company personnel.

Section 2 Reporting of Exploration Results

(Criteria in this section apply to all succeeding sections.)

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.*	Lanthanein Resources Ltd entered into a conditional agreement to acquire all the shares in Dalkeith Capital Pty Ltd (Dalkeith) which holds two granted exploration licences in the Gascoyne Region of Western Australia. The acquisition was completed on 4 January 2022. • The Gascoyne Project consists of 2 granted Exploration Licenses (E09/2515 and E09/2516). • All tenements are 100% owned by Dalkeith Capital. • The Gascoyne Project covers 2 Native Title Determinations including the Thudgari (WAD6212/1998) and the Combined Thiin-Mah, Warriyangka, Tharrkari and Jiwarli (WAD464/2016). • The Gascoyne Project is located over the following pastoral leases; Edmund, Gifford Creek,

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Criteria	JORC Code explanation	Commentary
		and Wanna.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Historical exploration of a sufficiently high standard was carried out in the region by a few parties including: Hurlston Pty Ltd 1986-1987: WAMEX Report A23584 Newmont 1990: WAMEX Report A32886 Newcrest 1990: WAMEX Report A36887 Desert Energy 2006-2007: WAMEX Reports A78056, A80879
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Gascoyne Project is located within the Gascoyne Province of the greater Capricorn Orogen – the region that records the collision of the Pilbara-Glenburgh Terrane at 2215–2145 Ma (Ophthalmian Orogeny) and eventual collision of Pilbara/Glenburgh and Yilgarn at 2005–1950 Ma (Glenburgh Orogeny), the Gifford Creek Carbonatite Complex (GCCC) intrudes the Durlacher Supersuite (including Yangibana and Pimbyana Granites) and the Pooranoo Metamorphics. The c.1360 Ma GCCC is composed of; • ~NW striking Lyons River Sills (calcio-, magnesio- and ferrocarbonatites) • ~NE striking fenite (alteration) veins • Yangibana Ironstones (REE ore bodies) • Magnetite-biotite dykes • Carbonatites in the region are thought to have been generated from melting of the Glenburgh Orogen-fertilized mantle during reactivation of structures (e.g. Lyons River Fault) at c. 1370 Ma followed by magma ascent along the same structures. • The Gascoyne Project is prospective for Ferrocarbonatite hosted REEs.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a*	An overview of the drilling program is given within the text within this document.

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Criteria	JORC Code explanation	Commentary
	tabulation of the following information for all Material drill holes: o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	No pXRF readings or metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	Drilling is undertaken close to perpendicular to the dip and strike of the mineralisation. The true thickness of the mineralisation intersected in drill holes cannot currently be calculated.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Refer to figures within this report.

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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.*	• The accompanying document is a balanced report with a suitable cautionary note.
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.*	• Suitable commentary of the geology encountered are given within the text of this document.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Additional RC drilling Additional Rock Chip sampling Resource Modelling

Section 3 Reporting of Mineral Resources

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Following importation, the data goes through a series of digital and visual checks for duplication and non- conformity, followed by manual validation by the competent person. • The database has been systematically audited by the CP. Original drilling records were compared to the equivalent records in the database. No major discrepancies were found.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• No site visit has been conducted by the CP. A site visit was not deemed necessary as it would not materially impact the outcome of these resource estimates. The CP is familiar

	• *If no site visits have been undertaken indicate why this is the case.*	with the region and has worked on projects in the vicinity of the Lyons Project.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• The confidence in the geological interpretation is considered to be moderate to high • Geological logging has been used to assist identification of lithology and mineralisation. The ironstone units are prominent in logging and able to be traced from hole to hole. • Alternative orientations to the ironstone units, and hence mineralisation, are unlikely, however there is the potential for repetitions, parasitic folding and offsets to be present and not detected in the relatively wide spaced drilling. • Geology is the primary control on mineralisation and accordingly the Mineral Resource. • Continuity of geology is readily observable, continuity of grade is more difficult to define.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The approximate dimensions of the Lyons 12&13 deposit are 1200m along strike (NW-SE), 120m across (NE-SW). The mineralisation has been drilled up to ~100m below surface. • The approximate dimensions of the Lyons 11 deposit is 900m along strike (ENE-WSW), 210m across (E-W). The mineralisation has been drilled up to ~90m below surface.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records*	• Grade estimation using Ordinary Kriging (OK) was undertaken using Surpac software. Detailed statistical and geostatistical investigations have been completed on the captured estimation data set (1m composites derived from sampling primarily carried out at 1m intervals). This includes exploration data analysis, boundary analysis and grade estimation trials. The variography applied to grade estimation has been generated using Snowden Supervisor. These investigations have been completed on the ore domain only. KNA analysis has also been conducted in Snowden Supervisor in various locations on the ore domain to determine the optimum block size, minimum and maximum

	and whether the Mineral Resource estimate takes appropriate account of such data. • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	samples per search and search distance. • Four elements, TREO (%), NdPr (%), Nb_2O_5 (%) and P (%) were estimated using parent cell estimation, with density being assigned by lithology. Only TREO, NdPr and Nb_2O_5 were reported, save for Lyons 11 where Nb_2O_5 was not reported due to insufficient data. Drill hole data was coded using three dimensional domains reflecting the geological interpretation based on the structural and lithological characteristics of the Mineral Resource. One metre composited data was used to estimate the domains. The domains were treated as hard boundaries and only informed by data from the domain. • No top cuts were used as no outliers were observed in the sample distributions • A Parent block size was selected at 10mE x 10mN x 4mRL, with sub-blocking down to 2.5 x 2.5 x 1m • Search Pass 1 used a minimum of 8 samples and a maximum of 22 samples in the first pass with an ellipsoid search. Search pass 2 used a minimum of 4 samples and a maximum of 22 samples with an ellipsoid search. • A dynamic search strategy was used with the search ellipse oriented to the semi-variogram model. The first pass was at the variogram range, with the second pass expanding the ellipse by a factor of 1.5 to inform any remaining unfilled blocks. The majority of the Mineral Resource was informed by the first pass. • No assumption of mining selectivity has been incorporated into the estimate. • Total Rare Earth Oxides (TREO), NdPr, and Nb_2O_5 were estimated in the Mineral Resource. • The deposit mineralisation was constrained by wireframes constructed based on geology (ironstone unit) and grade (>0.1% TREO). • Validation checks included statistical comparison between drill sample grades and

		the OK estimate results for each section. Visual validation of grade trends for each element along the drill sections was completed and trend plots comparing drill sample grades and model grades for northings, eastings and elevation were completed. These checks show reasonable correlation between estimated block grades and drill sample grades. • No reconciliation data is available as no mining has taken place
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages have been estimated on a dry in situ basis. No moisture values were reviewed.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The cut-off grade of 0.2% TREO for the stated Mineral Resource estimate is determined from economic parameters and reflects the current and anticipated mining practices, including reference to adjacent projects.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Preliminary review of the mining assumptions took place. Given the strike and width of the resource domains, the current assumed possible mining method is open cut. • Given the inferred classification of the resource, no further, or detailed mining assumptions or modifying factors have been considered necessary for application to the estimation process.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining*	• The Lyons Project is located adjacent to the Yangibana Project owned by Hastings Technology (ASX.HAS). Hastings have carried out extensive metallurgical testwork and due to the geological similarities between the

	reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	projects it is assumed that the Lyons Project will be able to be processed using similar technologies. • Given the inferred classification of the resource, no further, or detailed metallurgical assumptions or modifying factors have been considered necessary for application to the estimation process
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• Given the inferred classification of the resource, no detailed environmental assumptions or modifying factors have been considered necessary for application to the estimation process
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size*	• Bulk densities for the ironstone mineralisation and country rock have been estimated based on data from surrounding projects and regional information. This is adequate for the current estimate. • It is recommended that a suite of samples be collected by diamond drilling for bulk density work. These samples should be

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	and representativeness of the samples. • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	representative of the rock types, alteration and oxidation levels encountered at Lyons.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The Lyons 11-12-13 Mineral Resource has been classified as Inferred and reported in accordance with the JORC Code, 2012 edition. Resource classification is based on drill spacing, confidence in the mineralisation model, data quality and the early stage nature of the project. • The Mineral Resource reflects the Competent Persons view of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• No audits or review of the Mineral Resource estimate has been conducted.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an*	• The Mineral Resource estimate has been classified as Inferred. The drilling, geological interpretation and grade estimation reflects the confidence level applied to the Mineral Resource. • The Mineral Resource statement relates to global estimates of tonnes and grade.

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	approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	