ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

5 October 2023

New Tenement Application Adjacent to Significant Drill Results from Roadside Drilling at Murraydium REE Project

- **New Exploration Licence Application (2023/00045) lodged with South Australian Department of Energy and Mines**
- **ELA immediately adjacent to two reconnaissance roadside Air Core drill holes which returned significant assays targeting REEs in the shallow Loxton Parilla Sands (ASX 14/9/23)**
  - **SBT199: 2m @ 1,560ppm TREO including 1m @ 2,420 ppm TREO**
  - **SBT190: 1m @ 1,264ppm TREO**
- **Application covers further projected occurrences of the Loxton Parilla Sands to the north and east**
- **Loxton Parilla Sands the same formation that hosts Australian Rare Earths Ltd (ASX:AR3) recently upgraded Koppamurra Resource of 186mt @ 712 ppm TREO (Total Rare Earth Oxide) (1)**
- **Metallurgical test work testing Desorption and Leach responses on significant intersections to be carried out at ANSTO**

Mr Brian Thomas, Lanthanein Technical Director commented *"As a result of the significant assay results received from the roadside drilling programme immediately adjacent to the eastern boundary of the Bordertown Block at the Murraydium Project in the South East of South Australia, we have applied for tenure to the east and north of those drill hits. These significant results once again confirm the exciting exploration opportunity in the region for ionic clay hosted rare earth deposits as evidenced by AR3 who have outlined an extensive mineralised system at Koppamurra where shallow near surface exploration has delineated a recently upgraded JORC Resource of REEs."*

[1] JORC resource comprising 0.8Mt @ 747ppm TREO (Measured), 98Mt @ 716ppm TREO (Indicated) and 88Mt @ 709ppm TREO (Inferred) (19 September 2023)

ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

Lanthanein Resources Ltd (ASX: LNR) (**Lanthanein** or the **Company**) is pleased to announce that following receipt of the assay results from the roadside drilling programme at the Murraydium Project in the Southeast of South Australia (ASX 14/9/2023), it has applied for additional tenure to the east and north (Fig 1). The drill program targeted ionic clay hosted rare earths within the Loxton-Parilla Sands unit which is present throughout the Murray Basin in South Australia and Victoria (Fig 2).

The two drill holes immediately adjacent to the eastern boundary of the Bordertown Block of E6717 returned the following significant assay results:

- SBT199: 2m @ 1,560ppm TREO including 1m @ 2,420 ppm TREO from 19m depth, with combined 23% Neodymium/Praseodymium (Nd/Pr) and 1.8% Dysprosium (Dy)
- SBT190: 2m @ 808 ppm TREO including 1m @ 1264 ppm TREO from 14m depth, with combined 21% Nd/Pr and 2.5% Dy

Neodymium **Nd_2O_3** from the mineralised intersection also range from 11% to 23% of TREO.

As was the case with the existing tenement, EL 6717, the initial exploration on the new tenement will consist of reconnaissance air core drilling on the roadside verges controlled by the local government authorities in locations that are not covered by exempt land provisions such as being 400m from a residence or 150m from a dam, spring or reservoir. Prior to drilling the Company will once again conduct an extensive community, stakeholder and landholder consultation process on the proposed exploration activities. Should the reconnaissance roadside drilling encounter significant REE occurrences the Company will then commence negotiations with the adjacent private land holder to gain access to their paddocks to enable the conduct of a more systematic exploration programme plus an agreed rehabilitation of the land post the exploration.

The Murraydium Project is located in the South East region of South Australia with EL 6717 covering an area of 872 km^2 of the Murray Basin (Fig 3). The region is seeing continued activity in the exploration for REE minerals with the success of Australian Rare Earths (ASX:AR3) at their 100% owned Koppamurra Project, host to a total mineral resource of 186 Mt @ 712 ppm TREO (Fig 3), plus other successes with Resource Base Ltd (ASX:RBX) announcing a maiden Inferred Mineral Resource Estimate of 21Mt @ 767 ppm TREO at their Mitre Hill Deposit in the Murray Basin in Victoria on 3 February 2023.

The project area forms part of an extensive Tertiary strand plain comprising a series of sandstone-dominant fluvial and beach-dune strand complexes. The sand units commonly form undulating sand ridges interspersed with low lying areas of clay, mud and sand. The Koppamurra Deposit of REE-bearing clays that contain the Yellow Tail and Red Tail deposits occurs within the lower part of the Loxton-Parilla Sand unit (Fig 2). The Loxton-Parilla Sand is a very extensive unit widely distributed across the southern Murray Basin. extensive areas of Loxton-Parilla Sand are exposed at surface within the Bordertown Block where it typically forms rolling terrain of low sandy hills and ridges.

ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

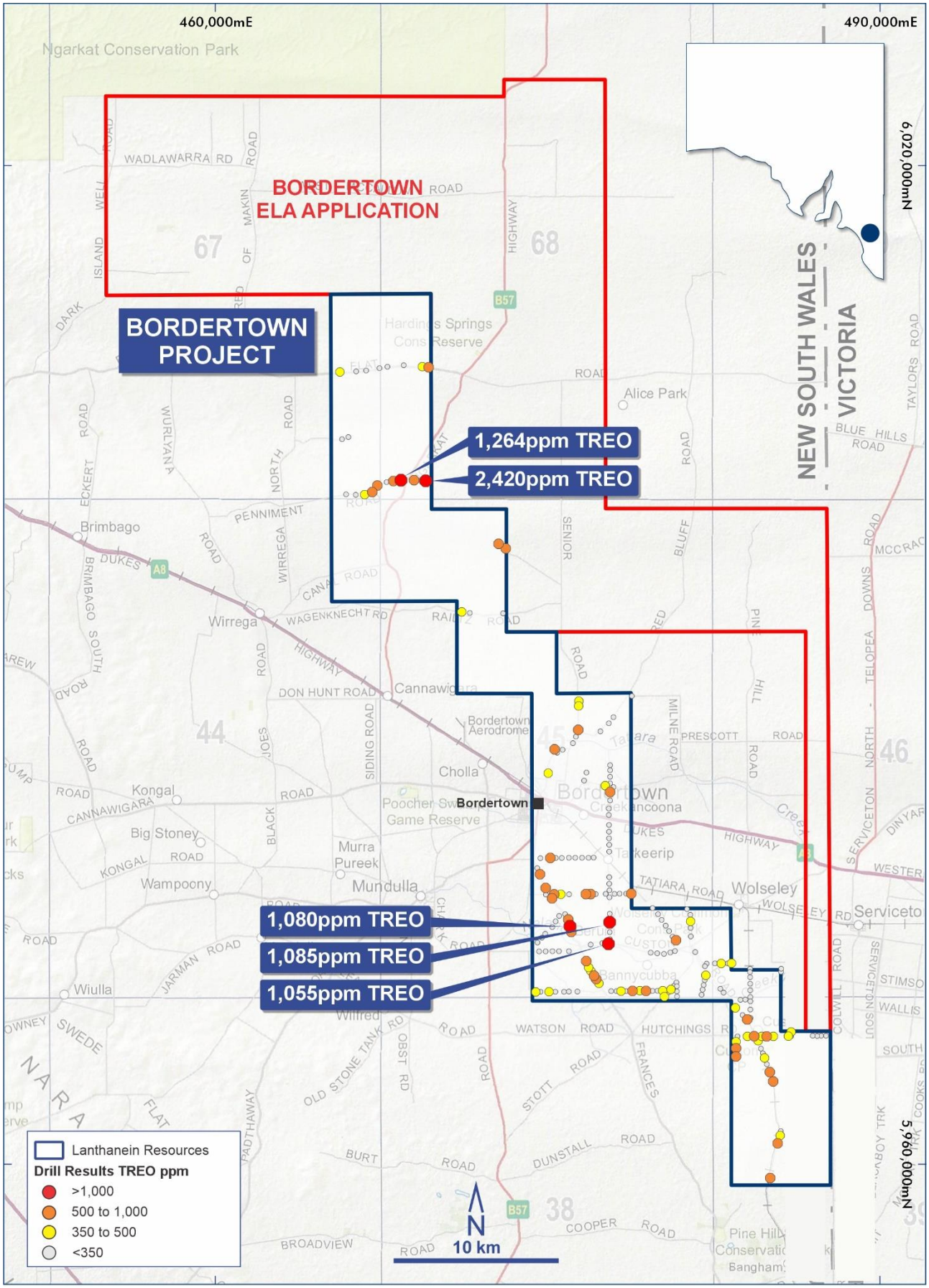

Figure 1: New Exploration Licence Application Adjacent to Reconnaissance Air Core Drill Holes with Significant Assays

ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

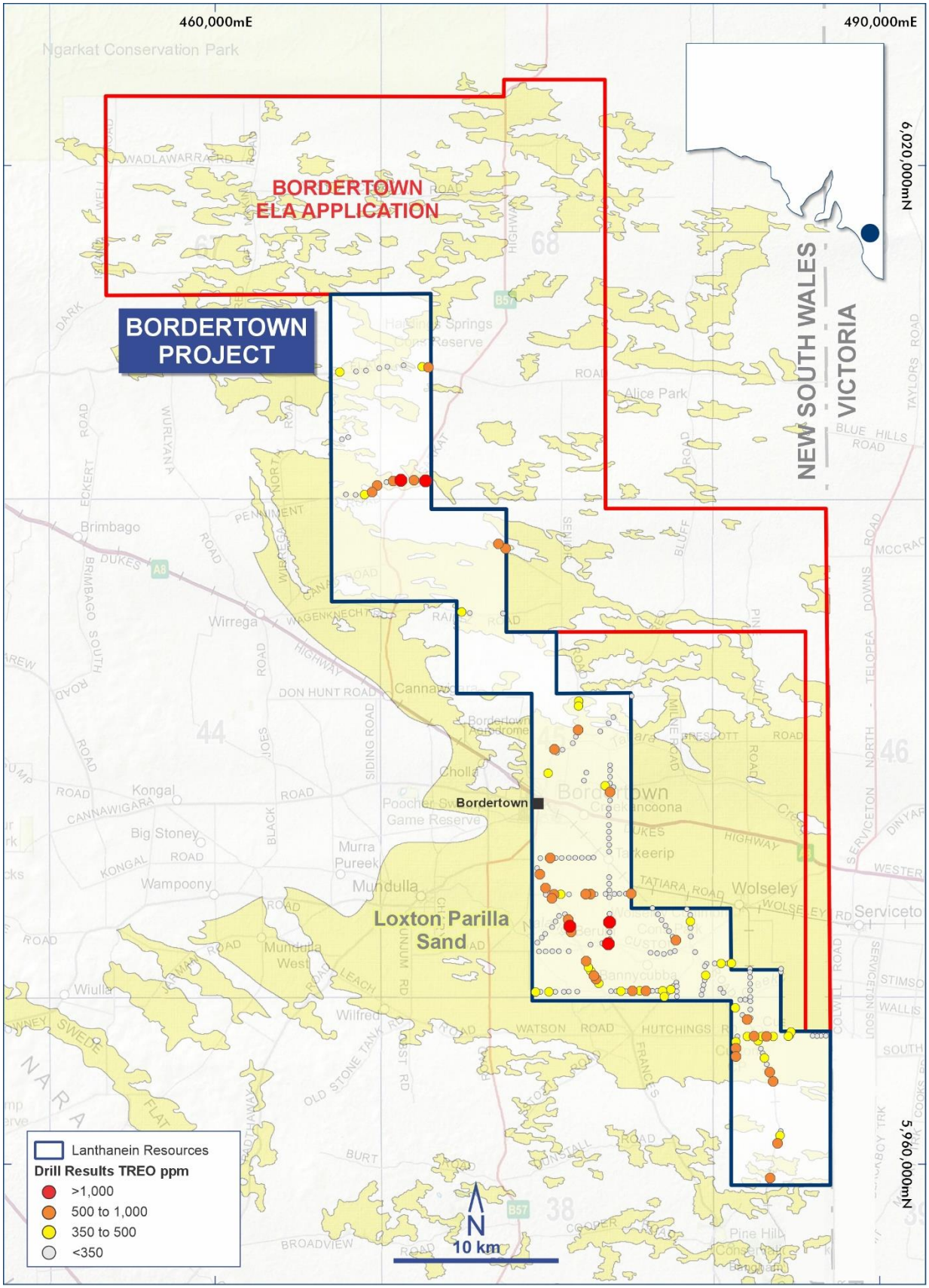

Figure 2: New Exploration Licence Application Overlain on Projected Loxton Parilla Sands Locations

ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

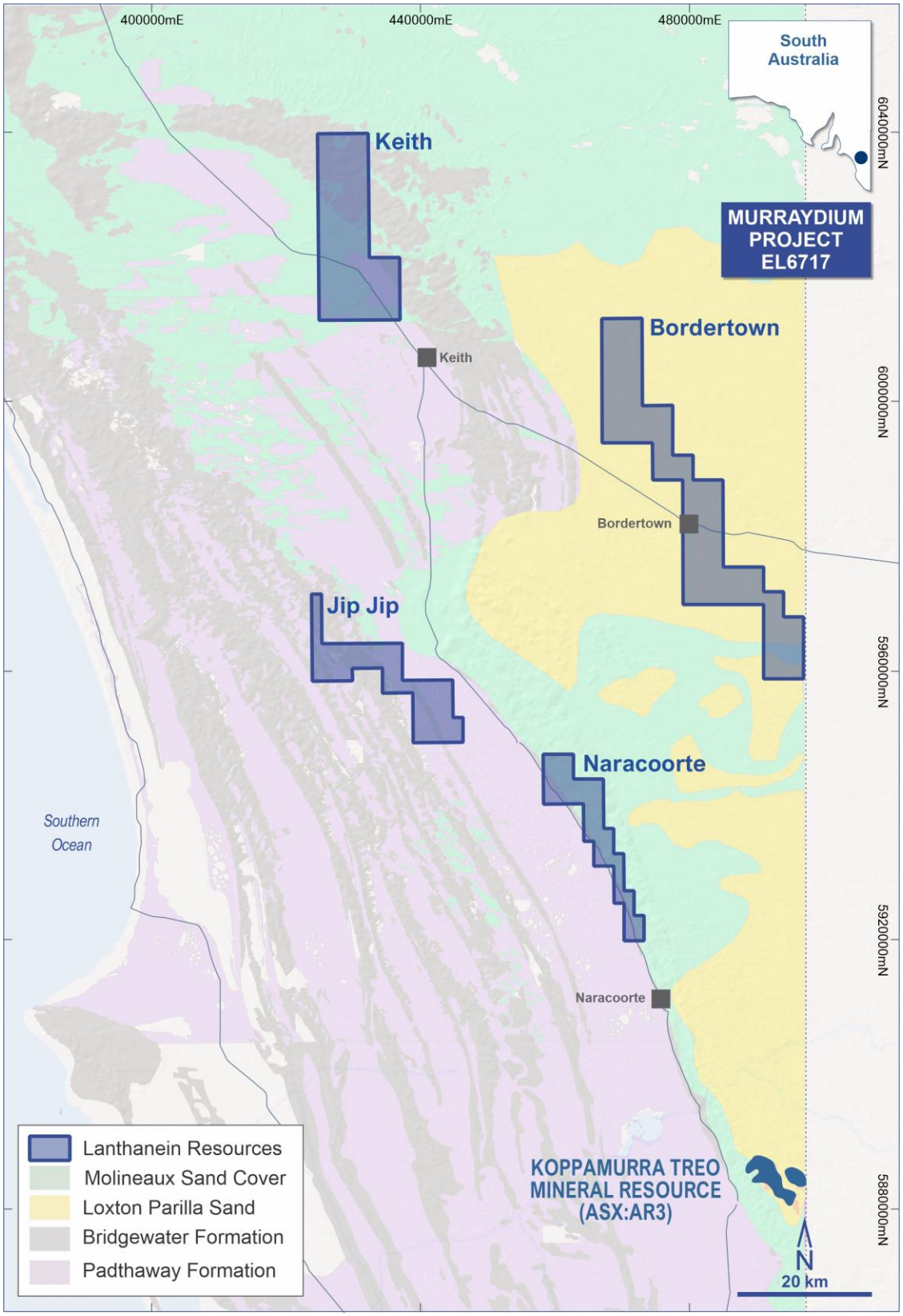

Figure 3: Plan showing extent of Loxton Parilla Sands in the Southeast of South Australia

ADDRESS
Level 8, 99 St Georges Terrace
Perth WA 6000
PHONE
+61 (08) 9486 4036

ABN
96 095 684 389

WEBSITE
www.lanthanein.com

Metallurgical Test Work

Mineralogical test work will be conducted on drill samples from the roadside drilling campaign by the highly regarded Minerals Group at the Australian Nuclear Science and Technology Organisation (ANSTO) to confirm that, as is the case at Koppamurra, the REE mineralisation in the Loxton Parilla Sands at Murraydium are in fact ionic clay deposits (IADs) which are commercially leached in China and Myanmar as a major source of rare earth elements.

A feature of the IADs is that the REEs are present as physically adsorbed ions which can be readily solubilised by displacing the REE ions with an appropriate cation. Typical desorption conditions are contact with 0.3-0.5 M ammonium sulphate (AS) at pH 4-5 for ~ 30 minutes at ambient temperature, 20-30 wt% solids. Under these conditions up to 70% extraction (typically 40-60%) of TRE+Y can be obtained, with very little dissolution of gangue elements, which makes for simple downstream processing to produce a mixed RE carbonate.

Over the last few years, there have been numerous reports of elevated concentrations of REEs associated with clays (clay-hosted REE deposits), but in many cases the deposits have not proven to be classic ionic clay deposits, and a lower pH has been found to be necessary to dissolve the REEs. Under these circumstances, the economics of the process will depend on REE extraction, acid consumption and the concentrations of dissolved gangue elements. An initial indication of potential economic viability of any such deposit can be obtained by leaching over a range of acidities to determine REE extraction versus gangue dissolution.

Work to date suggests that the source of the REE at Koppamurra is most likely basalt associated alkali volcanics of the Newer Volcanics Province in south-eastern Australia, with the wider Koppamurra project area being considered prospective for rare earth mineralisation.

However, whilst Koppamurra clays display ionic character, and the deposit shares a number of similarities with both ion adsorption clay deposits and volcanic ash fall placer deposits, there are also a number of differences, with further work required before a genetic model for REE mineralisation at Koppamurra and the broader Murray Basin can be conclusively defined. In addition, further work is required to better define metallurgical recoveries, process flow sheets, effective mining methods, and project economics.

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 report that relates to Geophysical Exploration Results is based on information compiled by Peter Swiridiuk - Member of the Aust. Inst. of Geoscientists. Peter Swiridiuk is a Technical Consultant and Non-Executive Director for Lanthanein Resources. Peter Swiridiuk has sufficient experience which is relevant to the type of mineralisation and type of deposit under consideration to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code of Reporting Exploration Results, Mineral Resources and Ore Resources. Peter Swiridiuk consents to the inclusion in the report of the matters based on the information in the form and context in which it appears. Additionally, Mr Swiridiuk confirms that the entity is not aware of any new information or data that materially affects the information contained in the ASX releases referred to in this report.