# Positioning Greenland To Be A Major International Rare Earth Supplier





**New World Metals Conference – 9 December 2020** 

#### **Important Notice**



This presentation contains only a brief overview of Greenland Minerals and Energy Ltd (Greenland Minerals) and its respective activities and operations. The contents of this presentation may rely on various assumptions and subjective interpretations which are not possible to detail in this presentation and which have not been subject to any independent verification.

This presentation contains a number of forward looking statements. Known and unknown risks and uncertainties, as well as factors outside of Greenland Minerals' control, may cause the actual results, performance and achievements of Greenland Minerals to differ materially from those expressed or implied in this presentation.

To the maximum extent permitted by law, Greenland Minerals and its officers, employees and advisers are not liable for any loss or damage (including, without limitation, any direct, indirect or consequential loss or damage) suffered by any person directly or indirectly as a result of relying on this presentation or otherwise in connection with it.

The information contained in this presentation is not a substitute for detailed investigation or analysis of any particular issue and has been prepared without consideration of your objectives and needs and financial position. Current and potential investors and shareholders should seek independent advice before making any investment decision in regard to Greenland Minerals or its activates.

#### JORC Code (2012) Competent Person Statement – Mineral Resources and Ore Reserves

The information in this report that relates to Mineral Resources is based on information compiled by Mr Robin Simpson, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr Simpson is employed by SRK Consulting (UK) Ltd ("SRK"), and was engaged by Greenland Minerals and Energy Ltd on the basis of SRK's normal professional daily rates. SRK has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence. Mr Simpson has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Robin Simpson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in the statement that relates to the Ore Reserves Estimate is based on work completed or accepted by Mr Damien Krebs of Greenland Minerals and Energy Ltd and Mr Scott McEwing of SRK Consulting (Australasia) Pty Ltd.

Damien Krebs is a Member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the type of metallurgy and scale of project under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.

Scott McEwing is a Fellow and Chartered Professional of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.

The mineral resource estimate for the Kvanefjeld Project was updated and released in a Company Announcement on February 12<sup>th</sup>, 2015. The ore reserves estimate was released in a Company Announcement on June 3<sup>rd</sup>, 2015. There have been no material changes to the mineral resource estimate, or ore reserves estimate since the release of these announcements.

#### **Company Highlights**



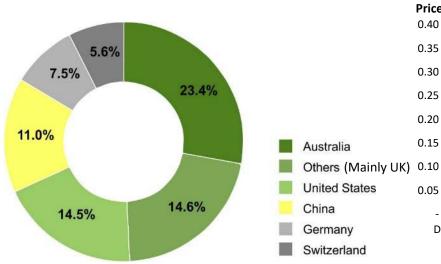


- World-Class Asset: 100% owned, globally unique Kvanefjeld Rare Earth Project
- Largest code-compliant RE resource: Enriched in both critical light (Nd, Pr) and heavy (Tb, Dy) RE's, with recovery of Uranium and Zinc by-products
- Simplest Processing Highly efficient, simple processing without complex mineral cracking
- Competitive Cost Structure Strong economic metrics, low-cost, long life development opportunity
- Strategic Shareholder Base: International RE specialists Shenghe Resources provide strong technical support and value chain connectivity. Shenghe has played a central role in the restart of the Mountain Pass rare earth mine located in United States, the only operating rare earth mine in North America.
- Extensive In-Country Experience: Operating in Greenland for over 12 years with extensive technical studies, permitting advanced, strong in-country relations, advanced engagement with industry participants and end-users.

### **Corporate Snapshot**International Shareholder Base



#### **CURRENT INVESTOR LOCATIONS**





#### **Board**

| Non-Executive Chairman     | Tony Ho      |  |  |  |  |  |
|----------------------------|--------------|--|--|--|--|--|
| Managing Director          | Dr John Mair |  |  |  |  |  |
| Non-Executive Director     | Simon Cato   |  |  |  |  |  |
| Non-Executive Director     | Xiaolei Guo  |  |  |  |  |  |
| Top Shareholders           |              |  |  |  |  |  |
| Shenghe Resources Holdings | 125M shares  |  |  |  |  |  |
| Tracor Limited             | 53M shares   |  |  |  |  |  |

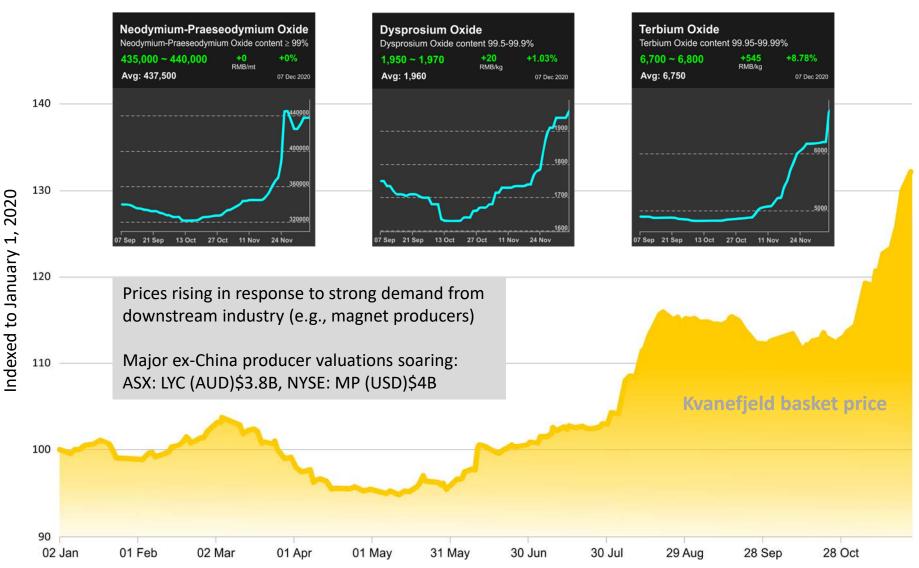
#### **Capital Structure**

| Shares outstanding    | 1,322 M                    |
|-----------------------|----------------------------|
| Market capitalization | <b>A\$330M</b> (@25 cents) |
| 52 week low:          | \$0.07                     |
| 52 week high:         | \$0.34                     |
| Cash:                 | \$33M                      |

#### **Kvanefjeld Project Ownership - 100%**

## Rare Earth Sector Is Heating Up Demand Surging, Prices Rising





## **Greenland Minerals**A Growing Global Network

Orbicon

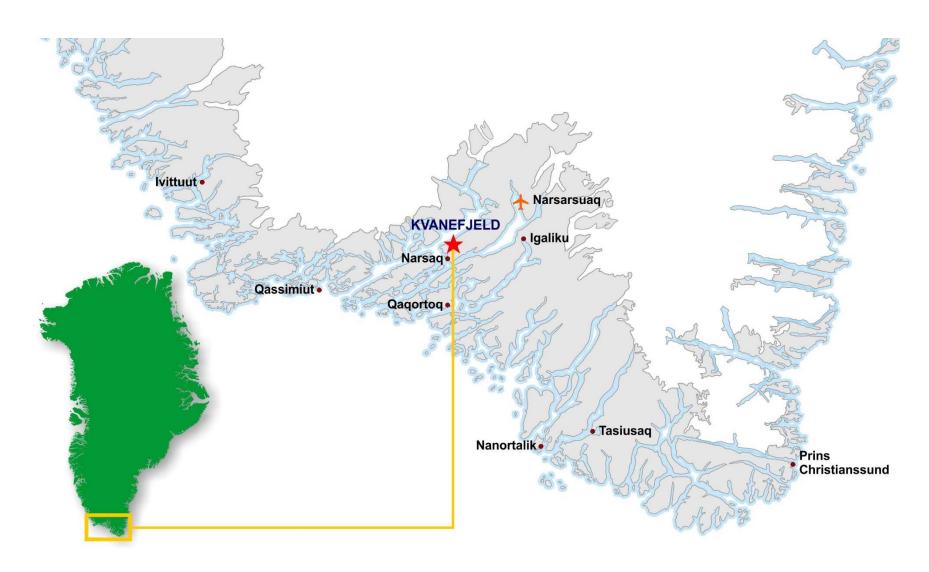


#### Greenland **Technical Support** Main Greenland office - Nuuk Shenghe Resources Holding Co Ltd Executive General Manager - Jørn Skov Nielsen Chengdu, China Corporate Social Responsibility – Johannes Kyed Operations base – Narsag \_ On-site Manager - Ib Laursen Joint Technical Steering Committee Greenland Minerals - Shenghe **Global Network of Consultants** SRK Consulting Tetra Tech **Nuna Logistics** Wood Group Corporate HQ - Perth, Australia China-CCC Managing Director Dr John Mair **Shared Resources** Administration – CFO Miles Guy **GHD** International **Technical and Commercial Development** Klohn Crippen Berger EIA, SIA management Arcadis

Data Management

### **Kvanefjeld Project Setting – Southern Greenland**

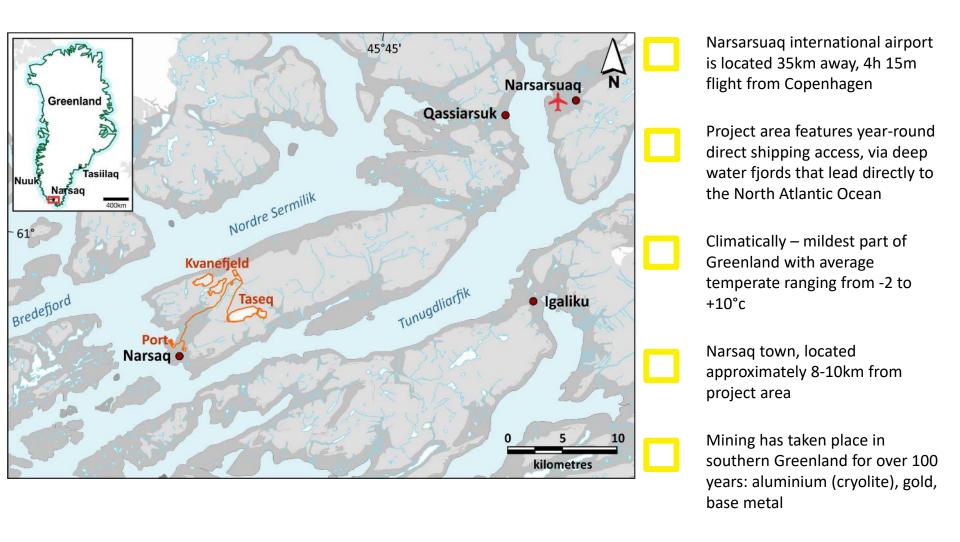




**Kvanefjeld** is located near existing infrastructure in southern Greenland, with year-round direct shipping access, airport nearby, and a mild climate; an optimal location

### **Kvanefjeld Project – Location and Access Deep water fjords provide direct shipping access**





### **Kvanefjeld Project Setting – Narsaq Valley**



- Direct shipping access to a world class ore body provides a major logistical advantage
- New industry and economic growth important to southern Greenland municipality

#### **Project Components:**

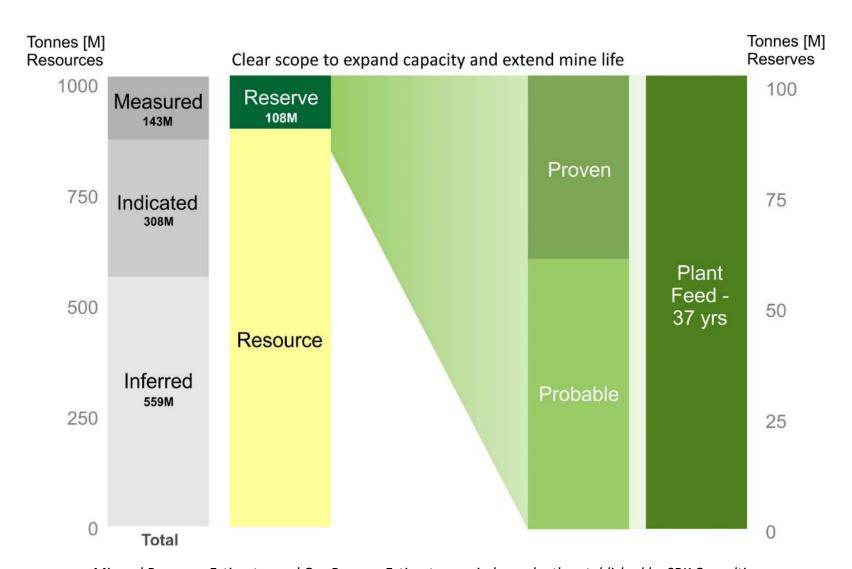
- Mine and concentrator (flotation circuit): REE mineral con, zinc con, fluorspar
- Atmospheric acid leach circuit & impurity removal: intermediate REE product, U by-product



### **Vast Mineral Inventory**



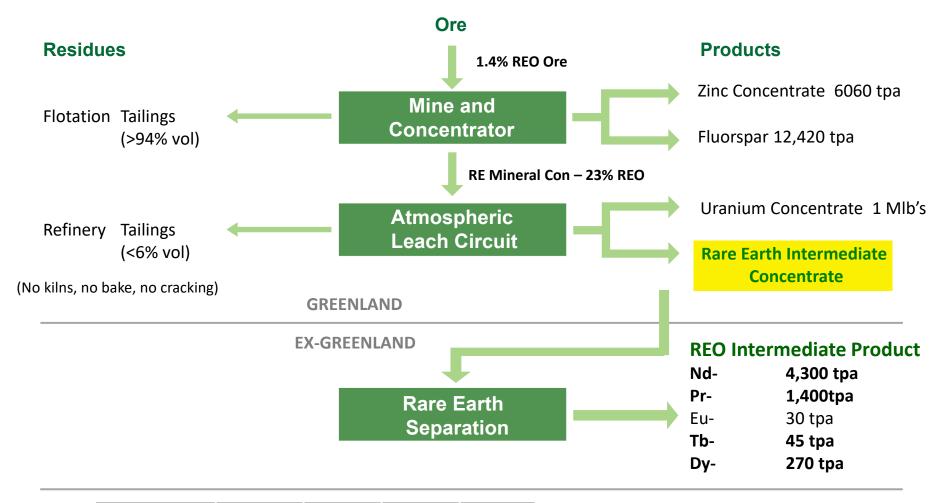
> 11Mt REO, 590Mlb's U<sub>3</sub>O<sub>8</sub>, 2.4Blb's Zn



Mineral Resource Estimates and Ore Reserve Estimates are independently established by SRK Consulting Total resources across three zones: Kvanefjeld, Sørensen, Zone 3

### Simple, Highly Efficient Processing





| Classification<br>(JORC 2012) | Inventory<br>(Mt) | REO<br>(ppm) | U <sub>3</sub> O <sub>8</sub><br>(ppm) | Zn<br>(ppm) |
|-------------------------------|-------------------|--------------|--|-------------|
| Proven                        | 43                | 14,700       | 352                                    | 2,700       |
| Probable                      | 64                | 14,000       | 368                                    | 2,500       |
| Total                         | 108               | 14,300       | 362                                    | 2,600       |

**37 Year Mine Reserves at Kvanefjeld Deposit** (~10% of project resource base)

JORC 2012: 1.01 Bt through 3 deposits contains 11.13 Mt REO, 593 Mlbs  $\rm U_3O_8$ , 2.42 Mt zinc

### Optimised Feasibility Study 2019 Highlights Project Strengths





Capital costs reduced to US\$505M (inclusive of 15% contingency on direct and indirect costs)



Rare earth production of 32,100t/a REO in intermediate product



Inclusive of 5,692 t NdPr oxide, 270 t Dy oxide, 44t Tb oxide



Initial 37 year mine life based on 108 Mt ore reserve



Simplest flow sheet of emerging RE projects – low technical risk



Lowest operating costs and capital intensity of emerging RE projects

### Rare Earth Value Chain Integration – Path to Market





- Collaboration with Shenghe since 2016
- Shenghe is an integrated RE supplier to global markets
- Kvanefjeld selected following review of >50 projects
- Successful technical collaboration, optimisation
- Joint engagement of European stakeholders
- Shenghe bring full value chain proficiency to Kvanefjeld





## **European Industry – A Growing RE Demand Centre Actively Engaging Organisations and Industry**



- Rare earths are critical to Europe's green industrial sector (EV's, wind turbines)
- European Commission launched the European Raw Materials Alliance in September 2020
- Greenland Minerals ideally placed to provide secure, stable supply of all critical magnet rare earths for European industry

#### **Company actively engaging:**

- Global Rare Earth Industry Association (REIA) funded by EIT Raw Materials GmbH
- European Raw Materials Alliance develop resilient value chains for EU industry
- European Rare Earth Resources focused on technical aspects of RE value chain

### **Advanced Permitting Status**





#### **Project Permitting - Review phase complete**

- ✓ Social Impact Assessment
  Reviewed, updated and accepted for public consultation
- ✓ Environmental Impact Assessment

EIA reviewed, accepted for public consultation: project meets Greenland guidelines & international standards, principles of Best Available Technology, Best Environmental Practice

#### Thorough and rigorous approach to impact assessments:

#### **Environmental Impact Assessment**

GHD (International), Orbicon (Denmark/Greenland), KCB, Arcadis, Danish Hydraulic Institute, Environmental Resource Management, DTU, Blue Water Shipping, Wood Group, **Shared Resources**: Overseen 2020 update

#### **Social Impact Assessment**

Shared Resources (International), NIRAS (Denmark)

### **Actionable Development Path Forward for 2021**









- Major milestone September 2020, EIA technical reviews complete; green light
- Project to be presented for public consultation late 2020 to early 2021, with follow-up white paper to be completed in Q2 2021 [precursors to mining license]
- Commercial development, marketing and off-take
- Engagement of end-user industries collaborators, strategic partnerships
- Down-stream processing strategy
- Conversion of optimised feasibility to DFS level

## **Strong Foundation Set for Development Success**Well-Positioned to Become An Integrated Global RE Supplier





| >1 billion tonne multi-element resource, largest REO inventory under JORC code |
|--|
| Project optimised in conjunction with major shareholder and industry leader    |
| Highly efficient processing, lowest cost quartile production costs             |
| Regulatory framework in legislated by Greenland and Danish governments         |
| Permitting advanced, EIA & SIA reviews completed                               |
| Developing a downstream processing strategy with Shenghe Resources             |
| Well-positioned for upcoming development window to meet RE demand surge        |



## Appendix



## **Unprecedented Demand Growth for Magnet Rare Earths Legislation Driving Transition to EV's, Renewable Energy**



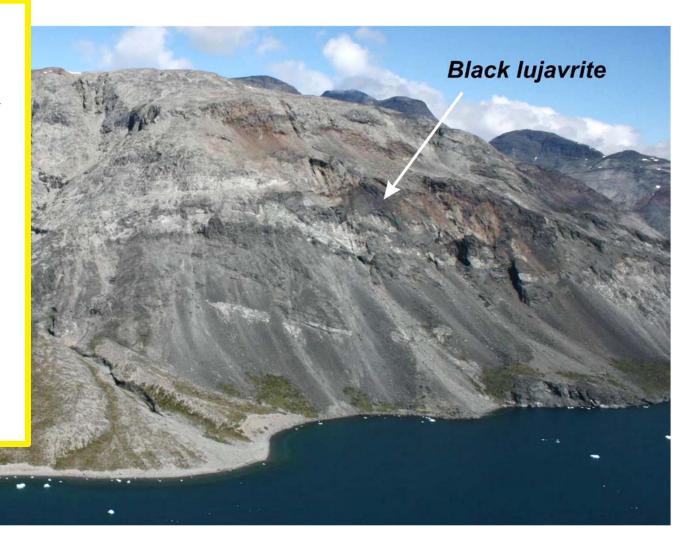
| Step change in global trends will drive a major increase in demand for magnet RE's   |
|--|
| Growth forecast across all categories (EV's, wind power, consumer appliances, electronics)   |
| Increasing shift from hybrid EV's to battery EV's drive further NdFeB demand as greater use of REmagnets in battery EV's (more Nd, Pr, Tb, Dy/vehicle)           |
| Overall – to 2030 demand for magnet RE's (Nd, Pr, Tb, Dy) to increase by >150% requiring a 2x increase in global production to keep up                           |
| With limited new supply, and major Chinese producers expected to absorb greater costs, pricing of key magnet metals expected to rise steadily through the decade |
| Excellent development window for Kvanefjeld – a globally significant, cost-competitive supplier of all key magnet metals – Nd, Pr, Tb, Dy                        |

### Centred on a Multi-Billion Tonne Outcropping Ore Seam



The only known bulk occurrence of steenstrupine globally – a unique, non-refractory rare earth mineral, that is conducive to simple, low-cost processing, without complex mineral cracking.

Kvanefjeld will be a step change in global rare earth supply



## **Statement of Identified Mineral Resources** (JORC – Code Compliant 2012)



| Multi-Element Resources Classification, Tonnage and Grade |                    |          |                   |                               |        |      |        |          |       |      | Contained Metal |          |                               |      |  |  |
|---|--------------------|----------|-------------------|-------------------------------|--------|------|--------|----------|-------|------|-----------------|----------|-------------------------------|------|--|--|
| <b>Cut-off</b>  | Classification     | M tonnes | TREO <sup>2</sup> | U <sub>3</sub> O <sub>8</sub> | LREO   | HREO | REO    | $Y_2O_3$ | Zn    | TREO | HREO            | $Y_2O_3$ | U <sub>3</sub> O <sub>8</sub> | Zn   |  |  |
| (U₃O <sub>8</sub> ppm) <sup>1</sup>                       |                    | Mt       | ppm               | ppm                           | ppm    | ppm  | ppm    | ppm      | ppm   | Mt   | Mt              | Mt       | M lbs                         | Mt   |  |  |
| Kvanefjeld - Fe   | bruary 2015        |          |                   |                               |        |      |        |          |       |      |                 |          |                               |      |  |  |
| 150   | Measured           | 143      | 12,100            | 303                           | 10,700 | 432  | 11,100 | 978      | 2,370 | 1.72 | 0.06            | 0.14     | 95                            | 0.34 |  |  |
| 150   | Indicated          | 308      | 11,100            | 253                           | 9,800  | 411  | 10,200 | 899      | 2,290 | 3.42 | 0.13            | 0.28     | 172                           | 0.71 |  |  |
| 150   | Inferred           | 222      | 10,000            | 205                           | 8,800  | 365  | 9,200  | 793      | 2,180 | 2.22 | 0.08            | 0.18     | 100                           | 0.48 |  |  |
| 150   | <b>Grand Total</b> | 673      | 10,900            | 248                           | 9,600  | 400  | 10,000 | 881      | 2,270 | 7.34 | 0.27            | 0.59     | 368                           | 1.53 |  |  |
| 200   | Measured           | 111      | 12,900            | 341                           | 11,400 | 454  | 11,800 | 1,048    | 2,460 | 1.43 | 0.05            | 0.12     | 83                            | 0.27 |  |  |
| 200   | Indicated          | 172      | 12,300            | 318                           | 10,900 | 416  | 11,300 | 970      | 2,510 | 2.11 | 0.07            | 0.17     | 120                           | 0.43 |  |  |
| 200   | Inferred           | 86       | 10,900            | 256                           | 9,700  | 339  | 10,000 | 804      | 2,500 | 0.94 | 0.03            | 0.07     | 49                            | 0.22 |  |  |
| 200   | <b>Grand Total</b> | 368      | 12,100            | 310                           | 10,700 | 409  | 11,200 | 955      | 2,490 | 4.46 | 0.15            | 0.35     | 252                           | 0.92 |  |  |
| 250   | Measured           | 93       | 13,300            | 363                           | 11,800 | 474  | 12,200 | 1,105    | 2,480 | 1.24 | 0.04            | 0.10     | 75                            | 0.23 |  |  |
| 250   | Indicated          | 134      | 12,800            | 345                           | 11,300 | 437  | 11,700 | 1,027    | 2,520 | 1.72 | 0.06            | 0.14     | 102                           | 0.34 |  |  |
| 250   | Inferred           | 34       | 12,000            | 306                           | 10,800 | 356  | 11,100 | 869      | 2,650 | 0.41 | 0.01            | 0.03     | 23                            | 0.09 |  |  |
| 250   | <b>Grand Total</b> | 261      | 12,900            | 346                           | 11,400 | 440  | 11,800 | 1,034    | 2,520 | 3.37 | 0.11            | 0.27     | 199                           | 0.66 |  |  |
| 300   | Measured           | 78       | 13,700            | 379                           | 12,000 | 493  | 12,500 | 1,153    | 2,500 | 1.07 | 0.04            | 0.09     | 65                            | 0.20 |  |  |
| 300   | Indicated          | 100      | 13,300            | 368                           | 11,700 | 465  | 12,200 | 1,095    | 2,540 | 1.34 | 0.05            | 0.11     | 82                            | 0.26 |  |  |
| 300   | Inferred           | 15       | 13,200            | 353                           | 11,800 | 391  | 12,200 | 955      | 2,620 | 0.20 | 0.01            | 0.01     | 12                            | 0.04 |  |  |
| 300   | <b>Grand Total</b> | 194      | 13,400            | 371                           | 11,900 | 471  | 12,300 | 1,107    | 2,530 | 2.60 | 0.09            | 0.21     | 159                           | 0.49 |  |  |
| 350   | Measured           | 54       | 14,100            | 403                           | 12,400 | 518  | 12,900 | 1,219    | 2,550 | 0.76 | 0.03            | 0.07     | 48                            | 0.14 |  |  |
| 350   | Indicated          | 63       | 13,900            | 394                           | 12,200 | 505  | 12,700 | 1,191    | 2,580 | 0.87 | 0.03            | 0.07     | 54                            | 0.16 |  |  |
| 350   | Inferred           | 6        | 13,900            | 392                           | 12,500 | 424  | 12,900 | 1,037    | 2,650 | 0.09 | 0.00            | 0.01     | 6                             | 0.0  |  |  |
| 350   | <b>Grand Total</b> | 122      | 14,000            | 398                           | 12,300 | 506  | 12,800 | 1,195    | 2,570 | 1.71 | 0.06            | 0.15     | 107                           | 0.33 |  |  |

## **Statement of Identified Mineral Resources** (JORC – Code Compliant 2012)



| Multi-Element Resources Classification, Tonnage and Grade |                    |          |                   |                               |        |      |        |          |       |       | Contained Metal |          |                               |      |  |  |
|---|--------------------|----------|-------------------|-------------------------------|--------|------|--------|----------|-------|-------|-----------------|----------|-------------------------------|------|--|--|
| <b>Cut-off</b>  | Classification     | M tonnes | TREO <sup>2</sup> | U <sub>3</sub> O <sub>8</sub> | LREO   | HREO | REO    | $Y_2O_3$ | Zn    | TREO  | HREO            | $Y_2O_3$ | U <sub>3</sub> O <sub>8</sub> | Zn   |  |  |
| $(U_3O_8 ppm)^1$  |                    | Mt       | ppm               | ppm                           | ppm    | ppm  | ppm    | ppm      | ppm   | Mt    | Mt              | Mt       | M lbs                         | Mt   |  |  |
| Sørensen - Ma   | rch 2012           |          |                   |                               |        |      |        |          |       |       |                 |          |                               |      |  |  |
| 150   | Inferred           | 242      | 11,000            | 304                           | 9,700  | 398  | 10,100 | 895      | 2,602 | 2.67  | 0.10            | 0.22     | 162                           | 0.63 |  |  |
| 200   | Inferred           | 186      | 11,600            | 344                           | 10,200 | 399  | 10,600 | 932      | 2,802 | 2.15  | 0.07            | 0.17     | 141                           | 0.52 |  |  |
| 250   | Inferred           | 148      | 11,800            | 375                           | 10,500 | 407  | 10,900 | 961      | 2,932 | 1.75  | 0.06            | 0.14     | 123                           | 0.43 |  |  |
| 300   | Inferred           | 119      | 12,100            | 400                           | 10,700 | 414  | 11,100 | 983      | 3,023 | 1.44  | 0.05            | 0.12     | 105                           | 0.36 |  |  |
| 350   | Inferred           | 92       | 12,400            | 422                           | 11,000 | 422  | 11,400 | 1,004    | 3,080 | 1.14  | 0.04            | 0.09     | 85                            | 0.28 |  |  |
| Zone 3 - May 2  | 012                |          |                   |                               |        |      |        |          |       |       |                 |          |                               |      |  |  |
| 150   | Inferred           | 95       | 11,600            | 300                           | 10,200 | 396  | 10,600 | 971      | 2,768 | 1.11  | 0.04            | 0.09     | 63                            | 0.26 |  |  |
| 200   | Inferred           | 89       | 11,700            | 310                           | 10,300 | 400  | 10,700 | 989      | 2,806 | 1.03  | 0.04            | 0.09     | 60                            | 0.25 |  |  |
| 250   | Inferred           | 71       | 11,900            | 330                           | 10,500 | 410  | 10,900 | 1,026    | 2,902 | 0.84  | 0.03            | 0.07     | 51                            | 0.20 |  |  |
| 300   | Inferred           | 47       | 12,400            | 358                           | 10,900 | 433  | 11,300 | 1,087    | 3,008 | 0.58  | 0.02            | 0.05     | 37                            | 0.14 |  |  |
| 350   | Inferred           | 24       | 13,000            | 392                           | 11,400 | 471  | 11,900 | 1,184    | 3,043 | 0.31  | 0.01            | 0.03     | 21                            | 0.07 |  |  |
| Project Total   |                    |          |                   |                               |        |      |        |          |       |       |                 |          |                               |      |  |  |
| 150   | Measured           | 143      | 12,100            | 303                           | 10,700 | 432  | 11,100 | 978      | 2,370 | 1.72  | 0.06            | 0.14     | 95                            | 0.34 |  |  |
| 150   | Indicated          | 308      | 11,100            | 253                           | 9,800  | 411  | 10,200 | 899      | 2,290 | 3.42  | 0.13            | 0.28     | 172                           | 0.71 |  |  |
| 150   | Inferred           | 559      | 10,700            | 264                           | 9,400  | 384  | 9,800  | 867      | 2,463 | 6.00  | 0.22            | 0.49     | 326                           | 1.38 |  |  |
| 150   | <b>Grand Total</b> | 1010     | 11,000            | 266                           | 9,700  | 399  | 10,100 | 893      | 2,397 | 11.14 | 0.40            | 0.90     | 593                           | 2.42 |  |  |

<sup>&</sup>lt;sup>1</sup>There is greater coverage of assays for uranium than other elements owing to historic spectral assays. U<sub>3</sub>O<sub>8</sub> has therefore been used to define the cutoff grades to maximise the confidence in the resource calculations.

Note: Figures quoted may not sum due to rounding.

<sup>&</sup>lt;sup>2</sup>Total Rare Earth Oxide (TREO) refers to the rare earth elements in the lanthanide series plus yttrium.