

Company Announcement, October 22<sup>nd</sup>, 2018

## Civil Engineering Optimisation Set to Drive Down Capital Costs

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### HIGHLIGHTS

- **Team of highly specialised, globally-diversified engineering firms conducted on-site studies in September as part of the ongoing project optimisation**
  - **Site survey work successfully devised engineering design refinements**
  - **First outcome of these refinements is from Tetra Tech, who has outlined substantial reductions in civil earth works for site preparation**
  - **Cut volumes reduced by 80%, and fill volumes reduced by >60% from the 2016 Feasibility Study**
  - **A new civil construction cost estimate for the project is currently being compiled by Nuna Logistics with results expected by late November**
  - **The significant reduction in civil earth works will substantially reduce civil costs and further complement expected capital cost reductions driven by metallurgical process optimisation (concentrator - December 2017; refinery - January 2018)**
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*Managing Director Dr John Mair commented:*

*“With an overall goal of reducing capital costs, addressing the civil engineering strategy and civil earth works is an important part of the Kvanefjeld optimisation program.*

*The multi-disciplinary team of engineering groups that spent time on-site in September are establishing the optimal ways of maximising the advantages of the project setting to minimise civil works and associated capital costs.*

*Work by Tetra Tech is complete with major reductions to the amount of civil earth works required for site preparation. The Tetra Tech study is now with Nuna Logistics who are preparing the civil cost estimation, with outcomes expected in six weeks.*

*We look forward to updating on the resulting capital cost reductions.”*

**Greenland Minerals Ltd** ('GML' or 'the Company') is pleased to update on the optimisation of civil engineering design for the Kvanefjeld Project. Kvanefjeld is expected to be a long-life, low-cost producer of key magnet metals neodymium, praseodymium, dysprosium and terbium, with by-products including uranium and zinc.

In parallel to advancing through the project permitting schedule, GML has been continuing to technically optimise the project to improve its efficiency and reduce capital and operating costs. The technical aspects include metallurgical processing, and civil engineering design.

Metallurgical optimisation continues to progress under guidance from leading rare earth company and major shareholder Shenghe Resources Holding Co Ltd (Shenghe). This work is improving the efficiency of both the concentrator and refinery circuits and preparing the project for integration with downstream processing to produce high-purity industry ready products.

Shenghe is a major supplier of high-purity rare earth metals and oxides to end-users internationally. Under the MoU established with GML in August 2018, Shenghe is positioned to acquire mine product directly or refine and market rare earth products to an established international customer network.

Further development of the engineering design is set to reduce the capital costs, along with the project footprint and impacts. In 2015 GML released a Feasibility Study for the Kvanefjeld Project, and an updated Feasibility Study in 2016 following pilot plant operations and further engineering studies. Civil earth works to prepare sites for plant and equipment represented a major contributor to project capital costs.

To address engineering design and costs GML brought together on-site a collective of specialist engineering groups including **Nuna Logistics, Tetra Tech, PND Engineers** and **China Communications Construction Co (C-CCC)**. Work on-site was conducted in September (see Company announcement September 18<sup>th</sup>, 2018), and follow-up studies have since been underway by each respective group.

Tetra Tech has completed their work to produce a heavily revised pad for the process plant, that is shaped to match the natural land contours thereby leading to a substantial reduction in the amount of civil construction effort.

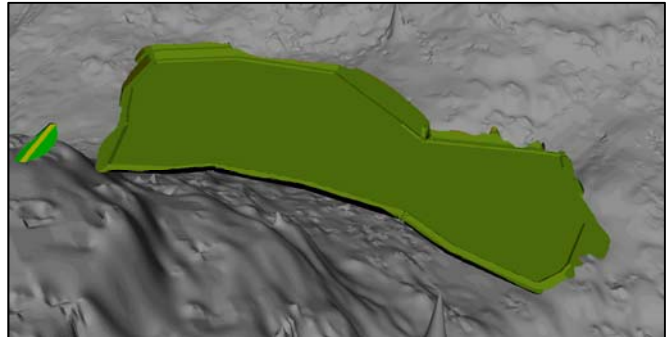
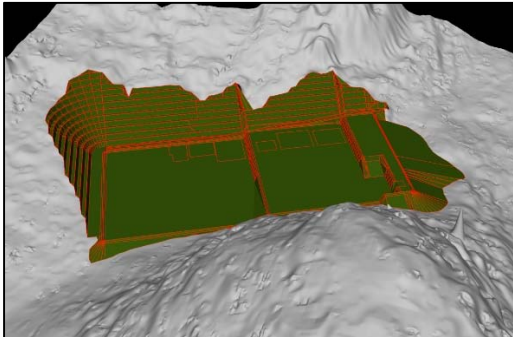
Nuna Logistics is currently compiling a new civil construction cost estimate for the project based on the updated civil design which will quantify the cost reductions. Nuna Logistics are a Canadian Civil and Mining Contractor with specific arctic expertise. The results of the new civil costs are expected in late November.



Kvane fjeld plateau – an open pit mine is planned for behind the ridge where the main Kvane fjeld deposit is located

Processing facilities will be located in the upper part of the valley thereby minimising both visual and noise impacts to the nearby town of Narsaq, located to the right.

View from the Narsaq heliport, up the valley toward the Kvane fjeld project area. Much of the mine area and the processing facilities will not be visible from Narsaq town.



Above left – the projected plant site as planned in the 2016 Feasibility Study involved a considerable amount of cut to prepare the site for plant and equipment. Following site surveys and engineering studies in 2018, a new site plan has been developed to blend with contours allowing for a substantial reduction in civil earth works (above right).

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## ABOUT GREENLAND MINERALS LTD.

Greenland Minerals Ltd (ASX: GGG) is an exploration and development company focused on developing high-quality mineral projects in Greenland. The Company's flagship project is the Kvanefjeld Rare Earth Project (rare earth elements, uranium, zinc). A pre-feasibility study was finalised in 2012, and a comprehensive feasibility study was completed in 2015 and updated following pilot plant operations in 2016. The studies highlight the potential to develop Kvanefjeld as a long-life, low cost, and large-scale producer of rare earth elements; key enablers to the electrification of transport systems.

GML is working closely with major shareholder and strategic partner Shenghe Resources Holding Co Ltd to develop Kvanefjeld as a cornerstone of future rare earth supply. An exploitation (mining) license application for the initial development strategy has been undergoing review by the Greenland Government through the latter part of 2016 and through 2017.

In 2017-18, GML continues to undertake technical work programs with Shenghe Resources Holding Co Ltd that aim to improve the metallurgical performance, simplify the development strategy and infrastructure footprint in Greenland, enhance the cost-structure, and ensure that Kvanefjeld is aligned with downstream processing. In addition, the Company continues its focus on working closely with Greenland's regulatory bodies on the processing of the mining license application and maintaining regular stakeholder updates.

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Greenland Minerals Ltd will continue to advance the Kvanefjeld project in a manner that is in accord with both Greenlandic Government and local community expectations and looks forward to being part of continued stakeholder discussions on the social and economic benefits associated with the development of the Kvanefjeld Project.

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### **Competent Person Statement – Mineral Resources Ore Reserves and Metallurgy**

*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 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 Ltd and Mr Scott McEwing of SRK Consulting (Australasia) Pty Ltd. The information in this report that relates to metallurgy is based on information compiled by Damien Krebs.*

*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 reserve estimate was released in a Company Announcement on June 3<sup>rd</sup>, 2015. There have been no material changes to the resource estimate, or ore reserve since the release of these announcements.