



NORTHERN MINERALS

Powering Technology.



Quarterly Activities Report

SEPTEMBER 2018

This was a momentous period for the Company, with the official opening of the Browns Range Pilot Plant Project on 27 July. Commissioning and load testing of the circuit continues as the project moves into the production phase.

COMMISSIONING



Northern Minerals Limited (ASX:NTU); Northern Minerals or the Company is focused on production from the Browns Range Heavy Rare Earth Pilot Plant Project in northern Western Australia. Through the development of its flagship project, the Browns Range Project (the Project), Northern Minerals is the first and only meaningful producer of dysprosium outside of China.

Commissioning is progressing on the three-year pilot plant project with first production of heavy rare earth carbonate in October 2018. The pilot plant development will continue with its R&D studies and will provide the opportunity to gain production experience, surety of supply for our offtake partner and assess the economic and technical feasibility of the larger full scale development.

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Corporate Overview

Highlights:

- ◆ The Pilot Plant Project was officially opened by the Hon. Alannah MacTiernan, Minister for Regional Development; Agriculture and Food; Minister assisting the Minister for State Development, Jobs and Trade.
- ◆ Beneficiation and hydrometallurgical circuits are being commissioned and load tested ahead of continuous state production.
- ◆ Post-quarter end, first rare earth carbonate has been produced.
- ◆ Also, post-quarter end, the Company entered into a \$27 million funding agreement.
- ◆ On the exploration front, the Company confirmed two exciting high-grade discoveries at Dazzler and Iceman during the quarter.
- ◆ Ore sorting studies confirm the potential to double the mill head grade.



Browns Range processing plant with bagged heavy rare earth carbonate, centre

Browns Range Project Update

Northern Minerals focussed on commissioning and load testing the circuit for its 100% owned, dysprosium-rich Browns Range heavy rare earth element project, located 160km south east of Halls Creek in the Tanami region of Western Australia and the Northern Territory during the reporting period.



With the commencement of production, the Company is now the first dysprosium producer outside of China through the development of the high-grade Browns Range Project. This places Northern Minerals in a unique position to capitalise on the growing demand for the dysprosium in the production of rare earth

permanent magnets commonly used in the production of motors for burgeoning electric vehicles sector, where industry commentators now agree demand has reached an inflection point.

Browns Range – Site Activities

During the September quarter, commissioning and load testing of the beneficiation and hydrometallurgical circuits were the focus, with first heavy rare earth carbonate production post-quarter end on 8 October 2018.



First RE carbonate produced at Browns Range



Official Project Opening

On Friday 27th July, the Browns Range Pilot Plant Project was officially opened by the Hon. Alannah MacTiernan MLC, Minister for Regional Development; Agriculture and Food; Minister assisting the Minister for State Development, Jobs and Trade and comes exactly a year to the day since WA Premier, the Hon. Mark McGowan MLA turned the first sod to commence construction.

The official opening was attended by representatives of the Federal, State and Local Governments, traditional owners, key suppliers and offtake partners and media.



Official opening of the Browns Range Project



New high-grade exploration discoveries

During the quarter, the Company announced that assays from RC drilling at the Iceman and Dazzler prospects have confirmed both as exciting new high-grade Heavy Rare Earth discoveries.

The assay results follow an earlier announcement (see ASX announcement Preliminary drilling results at Dazzler and Iceman highlight extensive new exploration target dated 2nd August 2018) whereby the Company reported preliminary results using portable XRF (pXRF) measurements of yttrium.

These two prospects are located less than 15km from the Browns Range processing plant (see Figure 1 below).

Table 1 – Iceman and Dazzler prospects RC drilling – High-grade assay results

Hole ID	Prospect	Width (m)*	From (m)	To (m)	Assay grade (% TREO)	Estimated intercept using pXRF
BRIR0002	Iceman	11	13	24	4.83	12m at 4% TREO
BRIR0004	Iceman	7	26	33	1.20	7m at 3% TREO
BRIR0007	Iceman	7	42	49	1.73	4m at 1% TREO
BRDR0010	Dazzler	18	25	43	9.10	19m at 8% TREO
BRDR0014	Dazzler	21	24	45	2.15	21m at 2% TREO

(TREO – Total Rare Earth Oxides - Total of La₂O₃, CeO₂, Pr₆O₁₁, Nd₂O₃, Sm₂O₃, Eu₂O₃, Gd₂O₃, Tb₄O₇, Dy₂O₃, Ho₂O₃, Er₂O₃, Tm₂O₃, Yb₂O₃, Lu₂O₃, Y₂O₃.)

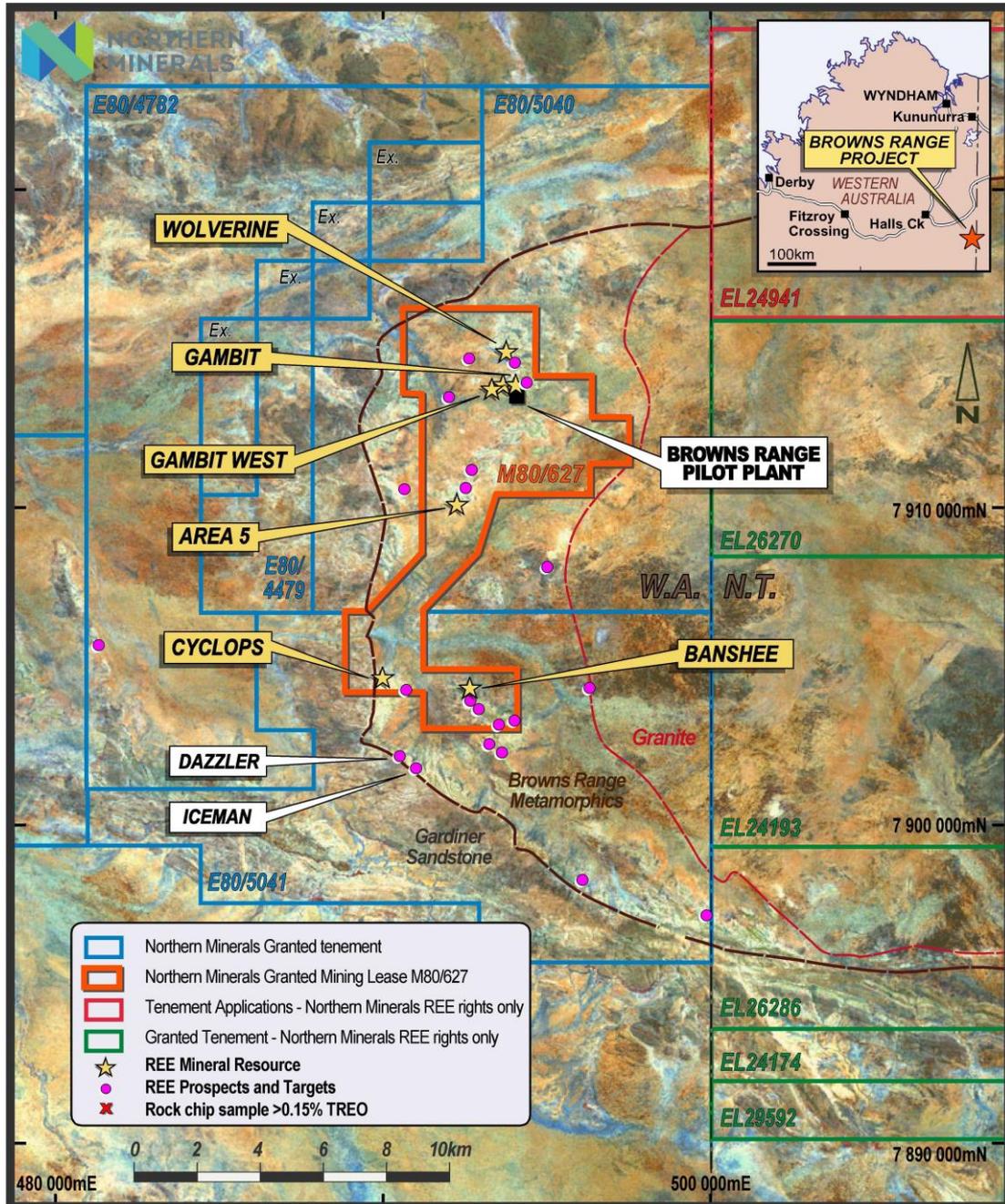
*Downhole widths only, true width is currently unknown



Drilling at Dazzler and Iceman



Browns Range Project – Prospect and Deposit location



Ore sorting has potential to double mill head grade

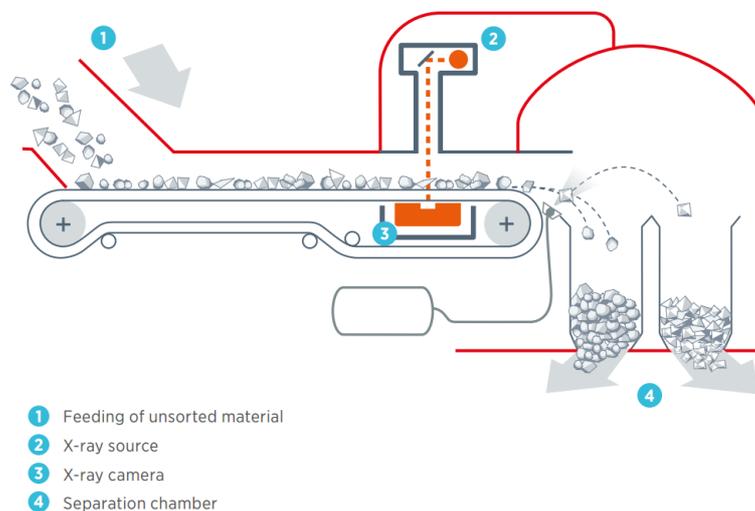
The Company has investigated using ore sorting on the five stockpiles at Browns Range to improve beneficiation and feed to the processing facility, which will in turn result in an increase in the amount of rare earth oxides that can be produced by the recently commissioned pilot plant.

Ore sorting tests have been completed on sample ore from each of the stockpiles currently on the ROM pad at Browns Range. The results indicate that approximately 80% of the value of the sortable fractions can be recovered in 20% of the mass, representing a four-times upgrade factor; or, alternatively, 90% of value can be recovered in 40% of the mass, representing a 2.25 times upgrade factor.

Given these encouraging results, the Company proposes to utilise ore sorting to target an increase in the head grade to the mill of 2% TREO. An increased mill head grade would provide an increase in TREO production at the current pilot plant design mill feed rate.

The Company believes the \$4 million up-front capital cost of retrospectively installing ore sorting technology ahead of the existing Brown Range Pilot Plant circuit is justified in light of the head grade improvement demonstrated in the testwork to date, along with the forecast economic benefits delivered by greater production output.

The Company is currently working on more testwork, approvals, planning and the funding required for ore sorting at Browns Range with a view to having ore sorting installed in Q2 2019.



A typical sorting schematic, in this case based on the Tomra technology



Production separation techniques offer revenue diversity

The Pilot Plant Project is planning on producing 570,000kg of TREO in a mixed rare earth carbonate, containing both dysprosium and terbium as revenue products. All the Pilot Plant production is being sold to JFMAG under an offtake agreement for the three-year Pilot Plant Project.

The Company has received many approaches from permanent magnet producers in the US, Europe, South Korea and Japan regarding the potential for the sale of separated rare earth oxide products from the potential large-scale project. This includes dysprosium oxide, terbium oxide, neodymium and praseodymium as well as the potential for the separation of other heavy rare earths.

Corporate and Financial

Listed Option Bonus Issue

The Company previously announced a bonus issue of new listed options to eligible shareholders on a 1-for-5 basis and with an exercise price of \$0.12 and an expiry date of 31 December 2019, subject to a prospectus being prepared and lodged with the Australian Securities and Investments Commission (ASIC).

The Company is in the process of finalising the documentation for this issue.

\$21.5m submitted for R&D rebate

During the quarter, the Company submitted its 30 June 2018 tax return which included a tax rebate of \$21.5 million for research and development (R&D) to advance the Browns Range Project during the 30 June 2018 year.

Also during the quarter, the Company has worked with its R&D advisor, Deloitte, to estimate the level of tax offsets for the September 2018 quarter. Innovation Structured Finance Co., LLC, a company associated with Brevet Capital Management (Brevet) has provided funding equal to 80% of the capped amount of \$4 million (as announced in the May 2019 Federal Budget), with the principal and accrued interest repayable out of actual tax offsets to be received at the end of the 2019 financial year.

\$27m funding package announced post end of quarter

Subsequent to the end of the quarter, the Company announced it had signed a \$27 million funding package which is to be received in full by the end of the year. Refer to the company's announcement on 16 October 2018 for details of the tranches and payments. This funding is to offset the \$10 million prepayment that has not been received from the off-taker and the gap in funding caused by the government announcement of a \$4 million cap on Research and Development rebates from 1 July 2018.



QUARTERLY ACTIVITIES REPORT

September 2018



Conferences and Marketing

During the September quarter, the Company presented to existing and potential investors in New York and Europe as well as exhibiting at the Diggers & Dealers conference in Kalgoorlie-Boulder in August.

December Quarter Activities

Key news flow expected during the December quarter includes:

- Progress of commissioning activities at Browns Range
- Export of first heavy rare earth carbonate from Browns Range
- Follow-up RC drilling at Iceman and Dazzler discoveries
- Execution of agreement for investigation into downstream processing technologies
- Completion of the \$27 million funding package

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About Northern Minerals

Northern Minerals Limited (ASX: NTU; Northern Minerals or the Company) has completed mechanical commissioning of the Browns Range Heavy Rare Earth Pilot Plant Project in northern Western Australia and commenced production of heavy rare earth carbonate.

Through the development of its flagship project, the Browns Range Project (the Project), Northern Minerals aims to build the Western Australian operation into the first significant world producer of dysprosium outside of China.

The Project is 100% owned by Northern Minerals and has several deposits and prospects containing high value dysprosium and other HREs, hosted in xenotime mineralisation.

Dysprosium is an essential ingredient in the production of DyNdFeB (dysprosium neodymium iron-boron) magnets used in clean energy and high technology solutions.

The three-year R&D Pilot Plant Project provides the opportunity to gain production experience, surety of supply for the Company's offtake partner and assess the economic and technical feasibility of the larger full-scale development.

For more information: northernminerals.com.au.





Tenement Report

Project	Location	Tenement ID	State	Status	Holder Application	Interest
Browns Range WA	Browns Range	E80/4479	WA	Granted	Northern Minerals	100%
	Browns Range	E80/4725	WA	Granted	Northern Minerals	100%
	Browns Range	E80/4726	WA	Granted	Northern Minerals	100%
	Browns Range	E80/4806	WA	Granted	Northern Minerals	100%
	Browns Range	E80/4782	WA	Granted	Northern Minerals	100%
	Browns Range	E80/5040	WA	Granted	Northern Minerals	100%
	Browns Range	E80/5041	WA	Granted	Northern Minerals	100%
	Browns Range	M80/627	WA	Granted	Northern Minerals	100%
	Browns Range	L80/76	WA	Granted	Northern Minerals	100%
	Browns Range	L80/77	WA	Granted	Northern Minerals	100%
	Browns Range	L80/78	WA	Granted	Northern Minerals	100%
	Browns Range	L80/79	WA	Granted	Northern Minerals	100%
	Browns Range NT	Browns Range	EL24193	NT	Granted	Northern Star Resources
Browns Range		EL24174	NT	Granted	Northern Star Resources	REE rights only
Browns Range		EL24941	NT	Application	Northern Star Resources	REE rights only
Browns Range		EL26270	NT	Granted	Northern Star Resources	REE rights only
Browns Range		EL26286	NT	Granted	Northern Star Resources	REE rights only



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John Galt	John Galt	E80/4298	WA	Granted	Northern Minerals	100%
	John Galt	E80/4779	WA	Granted	Northern Minerals	100%
	John Galt	E80/4967	WA	Granted	Northern Minerals	100%
	John Galt	E80/5070	WA	Application	Northern Minerals	100%
Boulder Ridge	Boulder Ridge	EL29594	NT	Granted	Northern Minerals	100% (excluding gold rights)
	Boulder Ridge	EL24849	NT	Application	Northern Minerals	100% (excluding gold rights)
	Boulder Ridge	EL24935	NT	Application	Northern Minerals	100% (excluding gold rights)
Gardiner-Tanami NT	Boulder Ridge	EL24177	NT	Granted	Northern Star Resources	REE rights only
	Boulder Ridge	EL25171	NT	Granted	Northern Star Resources	REE rights only
	Tanami	EL23932	NT	Granted	Northern Star Resources	REE rights only
	Tanami	EL25009	NT	Granted	Northern Star Resources	REE rights only
	Ware Range	EL26498	NT	Granted	Northern Star Resources	REE rights only
	Ware Range	EL26541	NT	Granted	Northern Star Resources	REE rights only
	Pargee	EL27367	NT	Granted	Northern Star Resources	REE rights only
	Tanami	EL29592	NT	Granted	Northern Star Resources	REE rights only

QUARTERLY ACTIVITIES REPORT

September 2018



	Tanami	EL29593	NT	Granted	Northern Star Resources	REE rights only
Gardiner-Tanami NT	Tanami	EL29595	NT	Granted	Northern Star Resources	REE rights only
	Tanami	EL23933	NT	Application	Northern Star Resources	REE rights only
	Ware Range	EL24179	NT	Application	Northern Star Resources	REE rights only
	Ware Range	EL24947	NT	Application	Northern Star Resources	REE rights only
	Ware Range	EL25003	NT	Application	Northern Star Resources	REE rights only
	Ware Range	EL25004	NT	Application	Northern Star Resources	REE rights only
	Tanami	EL25172	NT	Application	Northern Star Resources	REE rights only
	Tanami	EL29619	NT	Application	Northern Star Resources	REE rights only
	Tanami	EL29621	NT	Application	Northern Star Resources	REE rights only
	Tanami	EL26635	NT	Granted	Northern Star Resources	REE rights only
	Boulder Ridge	EL28868	NT	Application	Northern Star Resources	REE rights only
	Boulder Ridge	EL30132	NT	Application	Northern Star Resources	REE rights only
	Boulder Ridge	EL27590	NT	Granted	Northern Star Resources	REE rights only
	Rabbit Flats	Rabbit Flats 1	EL25157	NT	Application	Northern Star Resources

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	Rabbit Flats 2	EL25158	NT	Application	Northern Star Resources	REE rights only
	Rabbit Flats 3	EL25159	NT	Application	Northern Star Resources	REE rights only
Rabbit Flats	Rabbit Flats 4	EL25160	NT	Application	Northern Star Resources	REE rights only
	Rabbit Flats 5	EL23935	NT	Application	Northern Star Resources	REE rights only
Kurundi	Kurundi	EL29616	NT	Granted	Horn Resources	REE rights only



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Adrian Griffin
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Yanchung Wang
Non-executive Director

Nan Yang
Non-executive Director

Bin Cai
Alternate Director

Management
Robin Jones
Chief Operating Officer

Robin Wilson
Exploration Manager

Mark Tory
Chief Financial Officer/ Company
Secretary

Tony Hadley
General Manager

Eben Van Rooyen
Project Manager

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