

## Exploration targets identified to increase Browns Range Project's mine life

### Highlights

- Exploration Target estimate demonstrates the potential for very significant increases in Total Mineral Resource at Browns Range.
- Exploration Target estimate, which is reported in accordance with reporting criteria of the 2012 JORC Code, demonstrates that the mine life of the proposed full-scale operation of 3,000t TREO per annum could extend well beyond the current 11 years.
- Exploration Target estimate does not take into account the wider exploration potential of the Browns Range Dome across the Western Australian border into the Northern Territory.

Northern Minerals Limited (ASX: NTU; **Northern Minerals**) is pleased to report the completion of an Exploration Target estimate for the Browns Range Project (the Project). The Exploration Target is in addition to the current Total Mineral Resource estimate for the Project which currently stands at 56,663,000kg contained Total Rare Earth Oxides (TREO), see Table 1.

**Table 1: Mineral Resource estimate**

Deposit	Category	Mt	TREO	Dy <sub>2</sub> O <sub>3</sub>	Y <sub>2</sub> O <sub>3</sub>	Tb <sub>4</sub> O <sub>7</sub>	HREO	TREO
			%	Kg/t	Kg/t	Kg/t	%	Kg
Wolverine	Indicated	2.99	0.83	0.73	4.86	0.11	89	24,952,000
	Inferred	1.97	0.89	0.76	5.13	0.11	88	17,609,000
	Total <sup>1</sup>	4.97	0.86	0.74	4.97	0.11	89	42,560,000
Gambit West	Indicated	0.27	1.26	1.07	7.06	0.14	90	3,424,000
	Inferred	0.12	0.64	0.54	3.67	0.07	85	753,000
	Total <sup>1</sup>	0.39	1.07	0.91	6.04	0.12	89	4,177,000
Gambit	Indicated	0.05	1.06	0.92	6.62	0.12	97	533,000
	Inferred	0.06	1.2	1.01	6.8	0.15	95	671,000
	Total <sup>1</sup>	0.11	1.13	0.97	6.72	0.13	96	1,204,000
Area 5	Indicated	1.38	0.29	0.18	1.27	0.03	69	3,953,000
	Inferred	0.14	0.27	0.17	1.17	0.03	70	394,000
	Total <sup>1</sup>	1.52	0.29	0.18	1.26	0.03	69	4,347,000
Cyclops	Indicated	-	-	-	-	-	-	-
	Inferred	0.33	0.27	0.18	1.24	0.03	70	891,000
	Total <sup>1</sup>	0.33	0.27	0.18	1.24	0.03	70	891,000
Banshee	Indicated	-	-	-	-	-	-	-
	Inferred	1.66	0.21	0.16	1.17	0.02	87	3,484,000
	Total <sup>1</sup>	1.66	0.21	0.16	1.17	0.02	87	3,484,000
Total <sup>1</sup>	Indicated	4.69	0.70	0.59	3.95	0.09	87	32,862,000
	Inferred	4.28	0.56	0.46	3.15	0.07	87	23,802,000
	Total <sup>1</sup>	<b>8.98</b>	<b>0.63</b>	<b>0.53</b>	<b>3.56</b>	<b>0.08</b>	<b>87</b>	<b>56,663,000</b>

<sup>1</sup> Rounding may cause some computational discrepancies

TREO = Total Rare Earth Oxides - La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Pr<sub>6</sub>O<sub>11</sub>, Nd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>  
HREO = Heavy Rare Earth Oxides - Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>

HREO% = HREO/TREO \* 100

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An Exploration Target estimate of 4.2 - 8.8Mt at a grade range of 0.25 - 0.52% TREO for a total of 10,580,000kg to 45,725,000kg contained TREO, has been estimated and reported in accordance with reporting criteria of the 2012 JORC Code.

The potential quantity and grade of the Exploration Target estimate is conceptual in nature. There has been insufficient exploration completed in the areas of the Exploration Target and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

The Exploration Target estimate is predominantly based on extending the current Mineral Resources at the Wolverine, Gambit West, Area 5, Cyclops and Banshee deposits either at depth or along strike. The extensions to the resources are limited to zones where mineralisation remains open, and the geological and resource model appears to continue beyond the current limit of drilling.

Exploration Targets have also been estimated for the Area 5 North, Area 5 Repeat, Mystique, Nightcrawler, Polaris and Banshee South prospects based upon exploration drilling and surface geochemical sampling. Increasing the current Mineral Resource and in turn the Project's mine life is a key aspect of the project development work detailed in stage two of the 2016 Business Plan (announced 4 February 2016). Stage two involves developing the Project to Bankable Feasibility Study level with the inclusion of the results from studies aimed at reducing mining costs, boosting production, the production of a premium product and increasing the Ore Reserve.

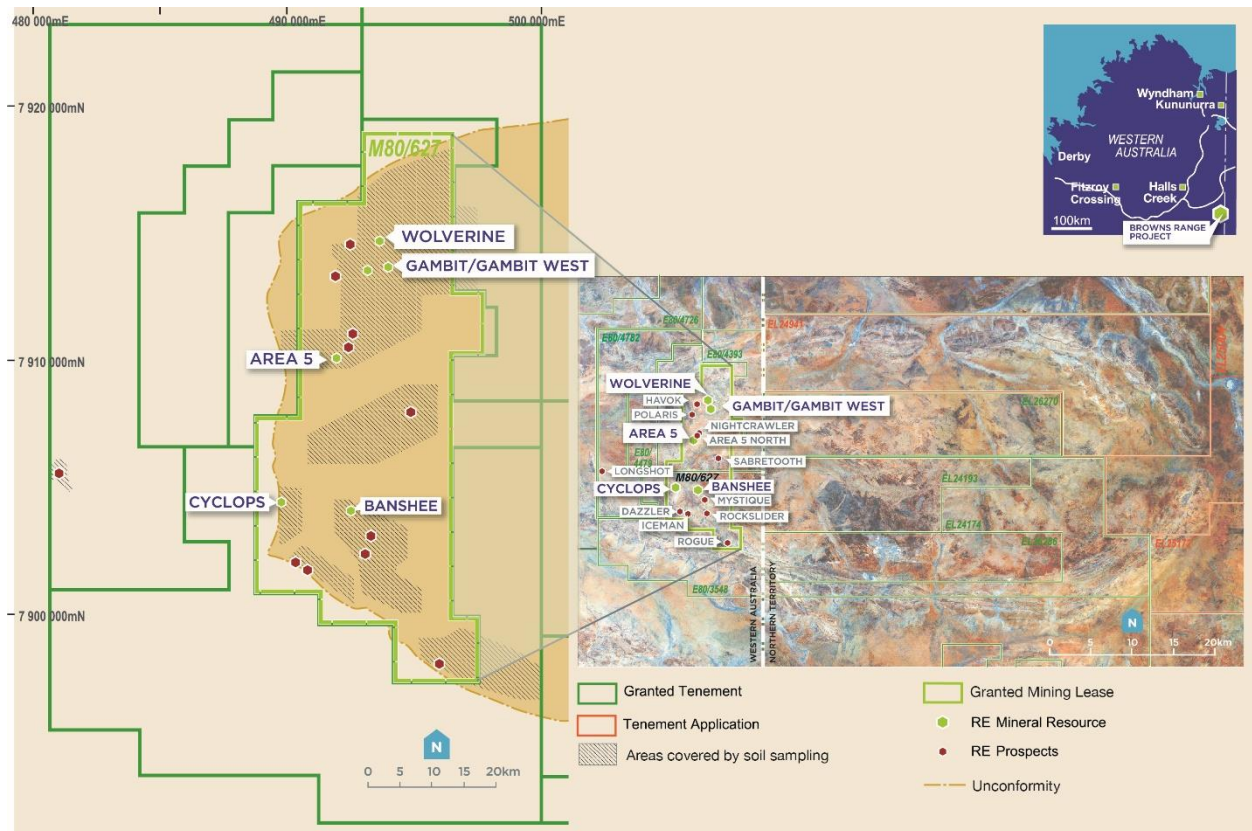
The individual Exploration Target estimates are detailed in Table 2 below.

**Table 2: Exploration Target summary (in addition to current Mineral Resource)**

	Exploration Target		
Prospect/deposit area	Tonnage range (Mt)	Grade range (%)	Contained TREO range (000s kg)
Wolverine	1.8 – 2.25	0.34 – 1.19	6,300 – 26,800
Gambit West	0.03 – 0.05	0.5 – 1.25	180 – 690
Area 5	0.1 – 0.25	0.1 – 0.4	100 – 1000
Cyclops	0.09 – 0.17	0.2 – 0.4	180 – 690
Banshee	1.38 – 1.74	0.2 – 0.3	2,770 – 5,220
Prospect	Tonnage range (Mt)	Grade range (%)	Contained TREO range (000s kg)
Area 5 North	0.15 - 0.3	0.2 – 0.5	300 – 1,500
Area 5 Repeat	0.35 – 0.75	0.1 – 0.4	350 – 3,000
Mystique	0.25 – 2.5	0.1 – 0.15	250 – 3,750
Nightcrawler	0.05 – 0.11	0.2 – 0.4	100 – 450
Polaris	0.01 – 0.38	0.2 – 0.4	25 – 1,500
Banshee South	0.01 - 0.28	0.2 – 0.4	25 – 1,125
<b>Total</b>	<b>4.22 – 8.78</b>	<b>0.25 – 0.52</b>	<b>10,580 – 45,725</b>

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Figure 1 – Browns Range Project – Location of deposits and exploration targets



## METHODOLOGY

### Wolverine

The Wolverine Exploration Target is based upon a robust geological model and extrapolation of the current resource model both at depth and along strike to the west, where the resource remains open. The Wolverine Mineral Resource block model was used to estimate the grade ranges for the Wolverine Exploration Target. The Wolverine geological model has been used to estimate the geometry of the Wolverine Exploration Target, which comprises two zones adjacent to the current Wolverine Mineral Resource; Ext1 - Down dip depth extension zone and Ext2 - Western strike extension zone (as shown in Figure 2 below).

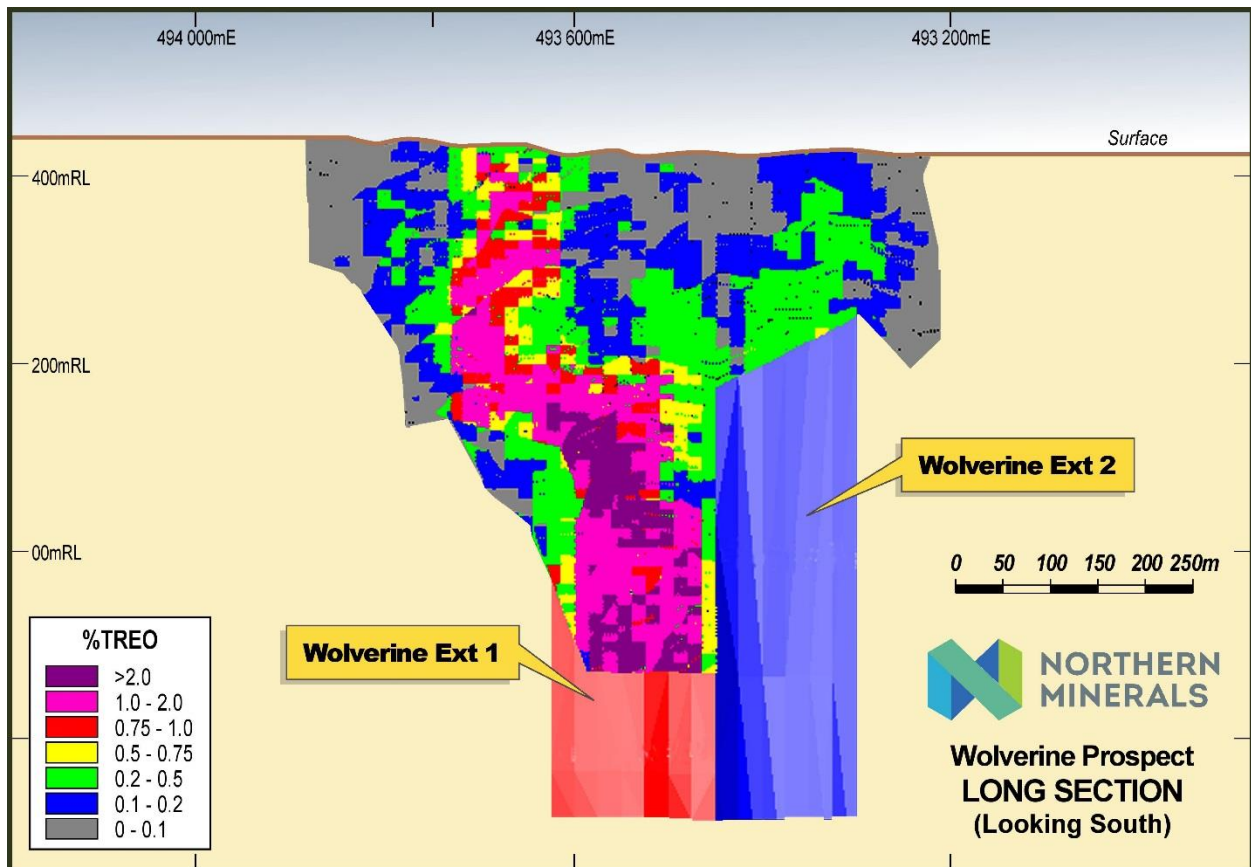
Wireframes were constructed for each of these zones using a range of dimensions that were consistent with the Wolverine resource model and then converted into tonnages using a bulk density value of  $2.5 \text{ gcm}^3$  (this value was used for all exploration targets described in this announcement). The down dip extension zones are to a maximum of 700m vertical depth. Economic analysis undertaken during the Definitive Feasibility Study (DFS) considered 700m to be economically viable at the expected TREO grades, using the underground mining method described in the DFS. The Wolverine Exploration Target is not based on actual exploration results but is based on a proposed drilling program.

The proposed drilling program will comprise of diamond core drilling to a vertical depth of 550m – 700m to test below the current Mineral Resource. A combination of reverse circulation (RC) and diamond core (DC) drilling will be used to test along strike to the west of the current Mineral

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Resource outline. Drilling at a nominal 50m x 50m or 50m x 25m spacing will be required in order to convert the Wolverine Exploration Target to an Inferred Mineral Resource. This program will be considered amongst several other high priority objectives aimed at developing the Project once sufficient funding has been secured.

**Figure 2 – Wolverine long section (looking south) block model showing Wolverine Exploration Target areas Ext 1 & Ext2**



### Gambit West, Area 5, Cyclops and Banshee

For the Gambit West, Area 5, Cyclops and Banshee Exploration Targets, a similar methodology was employed as described above. For all of these deposits, the Exploration Targets are not based on actual exploration results but are based on a proposed drilling program.

The Gambit West Exploration Target has been estimated using a geological model and an extrapolation at depth of the current Gambit West Mineral Resource outline, which is still open at depth. The Gambit West Exploration Target is the down dip projection of the currently defined mineralisation for an additional 100m vertical using geometries and grade ranges that are consistent with the current Mineral Resource.

Area 5 and Cyclops Exploration Targets were determined by extending mineralised zones within the existing Mineral Resources either down dip or along strike for approximately 50m beyond the current Mineral Resource outline. The grade ranges selected for these Exploration Targets are consistent with the current Cyclops and Area 5 Mineral Resources.

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The Banshee Exploration Target has extrapolated the current Mineral Resource outline for an additional 75m along strike to the west and 50m along strike to the east. Geometries and grade ranges that are consistent with the current Mineral Resource have been used. Surface geochemical soil sampling and portable XRF survey data has defined a significant yttrium anomaly, supporting the extrapolation of the target along strike. The Exploration Target is bounded at depth by a quartz-chlorite schist unit which is interpreted to dip moderately towards the south but is only occasionally weakly mineralised.

Figure 3 – Banshee prospect, drill section

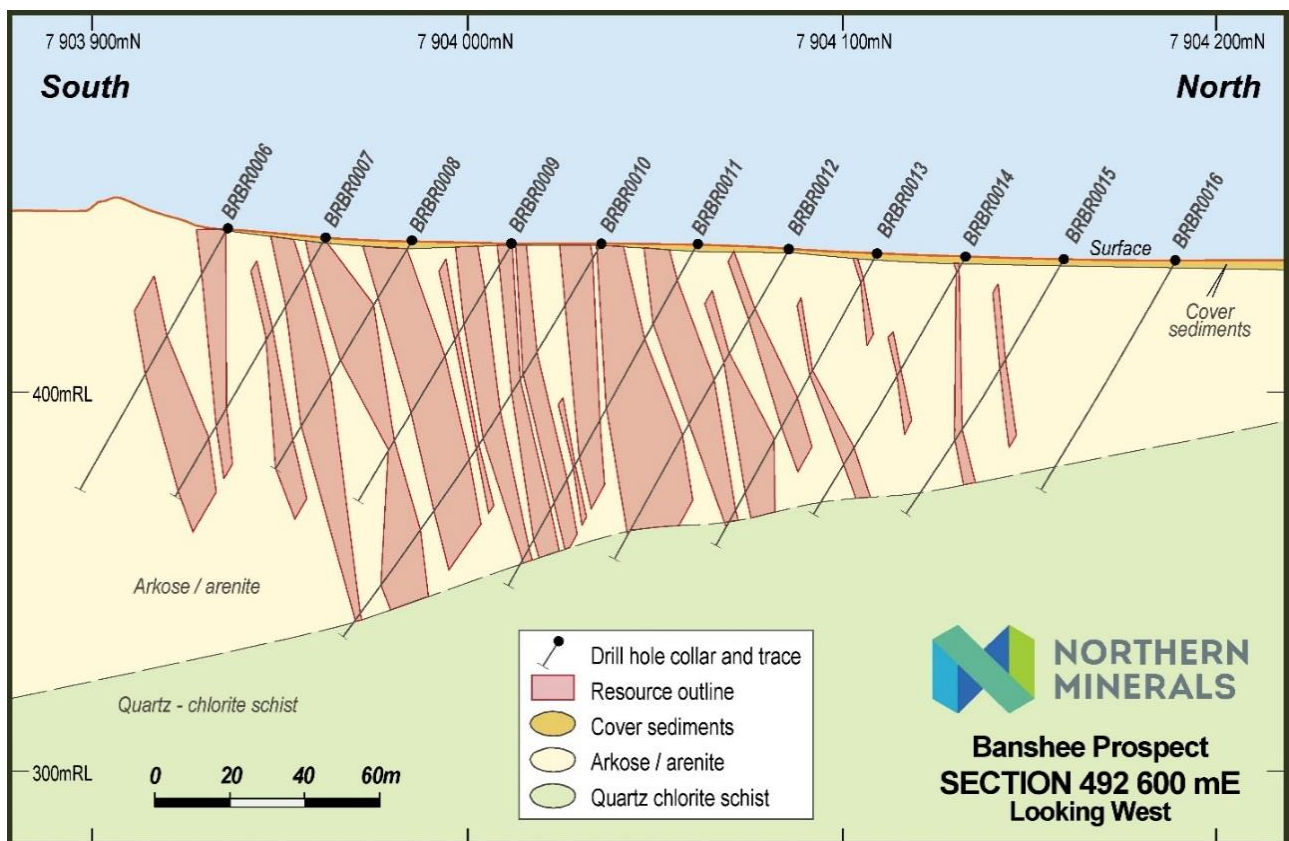
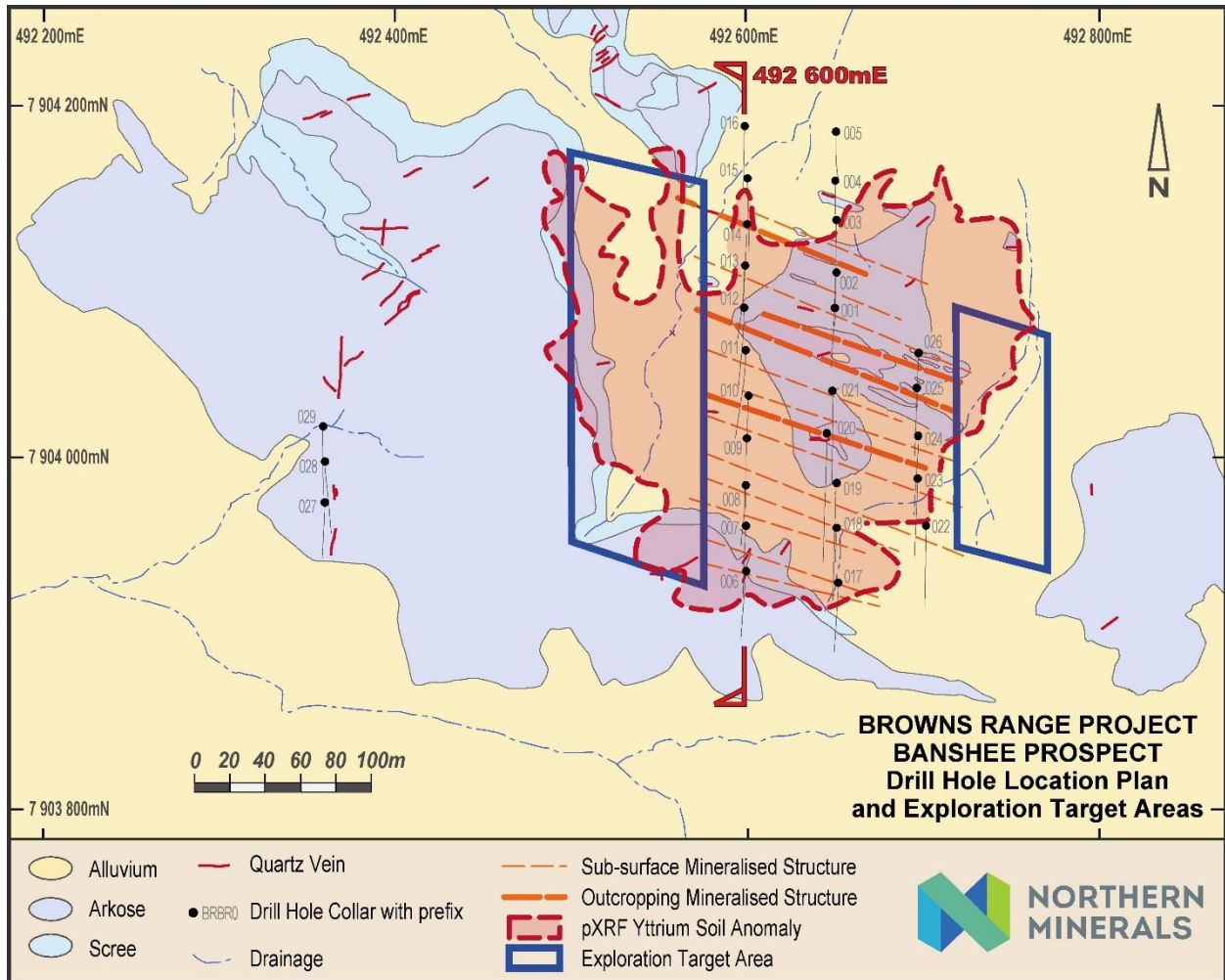


Figure 4 – Banshee prospect, drill hole location plan and Exploration Target areas



Drill testing of the Gambit West, Area 5, Cyclops and Banshee Exploration Targets will be predominantly with RC drilling at a nominal spacing of 50m x 25m, to depths of up to 250m vertical but mostly in the 100-200m vertical depth range. Any drilling proposed will be undertaken once sufficient funding has been secured.

**Area 5 North, Area 5 Repeat, Nightcrawler, Polaris, Mystique, Banshee South**

At the Area 5 North, Area 5 Repeat, Nightcrawler, Polaris and Mystique prospects, Exploration Targets have been estimated based on exploration results from RC drilling, rock chip, soil sampling and portable XRF surface surveys. The Area 5 North, Nightcrawler and Mystique Exploration Targets were determined by constructing wireframes of the mineralised domains, which are consistent with the geological interpretation. A bulk density value of 2.5gcm<sup>3</sup> was again used to convert the volumes into tonnages and the grade estimated using the average composite value for the domain. For all of these Exploration Targets there has been insufficient drilling to estimate a Mineral Resource.

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The Area 5 Repeat Exploration Target is located about 300m northwest along strike from the Area 5 deposit and is based on previous exploration results which included one fence of drilling with drill holes at 25m centres, and returned results up to 8m (19-27m) @ 0.5% TREO. The extent of the soil geochemical yttrium anomaly, and the tenor and style of mineralisation intersected in the drilling would indicate that the Area 5 Repeat Exploration Target is analogous with the Area 5 deposit.

The Polaris Exploration Target is located approximately 1.3km west along strike from the Gambit West deposit, and is considered analogous in terms of size, given that is interpreted to occur along the same geological structure. It has been estimated based on previous exploration results with RC drilling having intersected significant HRE mineralisation in several drill holes. Mineralisation occurs below several metres of cover with no geochemical soil or portable XRF yttrium anomaly detected at surface.

The Banshee South Exploration Target has been estimated based upon portable XRF surface yttrium anomalies and surface rock chip sampling.

All of the Exploration Targets described in this section, other than Polaris, occur at or near surface, meaning fewer drill metres will be required in order to assess their potential. A combination of RC and DC drilling will be used to drill test these exploration targets. RC drilling will predominantly be at a nominal drill spacing of 50m x 50m, with DC drill holes in selected areas to obtain structural data necessary to construct a robust geological model. Again, this program will only take place once sufficient funding has been secured.

### Browns Range Dome

In addition to the exploration targets described above, another 170 conceptual targets have been identified within Northern Minerals' over 1,500km<sup>2</sup> tenement package in the Browns Range Dome region. The Browns Range Dome is a very large geological feature, some 60km x 30km in extent, which straddles the Western Australia (WA)/Northern Territory (NT) border. Northern Minerals has recently secured further tenure over the Browns Range Dome through the purchase of four tenements in the NT from Toro Energy Ltd. Northern Minerals now holds full tenure over the vast majority of the highly prospective Browns Range Dome.

To date the vast majority of exploration has been focussed on the WA tenements which only comprises approximately one quarter of Northern Minerals' entire tenement package over the Browns Range Dome. Despite this, the WA portion of the tenement package still remains effectively underexplored, with large areas covered by transported soil cover which precludes effective surface soil geochemical sampling. First-pass exploration drilling is required to test and define new exploration targets, however only limited drilling of this nature occurred in 2014 and none in 2015.

**Competent Persons Declaration and Compliance Statements:**

The information in this announcement that relates to Exploration Targets is based on information that was compiled by Mr Robin Wilson who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Wilson is a full time employee of Northern Minerals and has sufficient experience 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 in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (the JORC Code). Mr Wilson 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 this announcement that relates to the Mineral Resource Estimates of Wolverine deposit is extracted from the report entitled "Increased Mineral Resource delivers more good news" dated 23 February 2015 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in the announcement that relates to the Mineral Resource Estimates of the Cyclops and Banshee deposits is extracted from the report entitled "Further Increase in Browns Range Mineral Resource" dated 15 October 2014 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in the announcement that relates to the Mineral Resource Estimates of the Gambit, Gambit West and Area 5 deposits is extracted from the report entitled "Wolverine Total Resource Doubled in a Major Upgrade of Browns Range HRE Mineral Resource Estimate" dated 26 February 2014 and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in the announcement that relates to Exploration Results at the Polaris, Area 5 North, Dazzler, Iceman and Nightcrawler prospects is extracted from the reports entitled "Further discoveries reinforce exploration potential at Browns Range" dated 15 October 2014 and "Quarterly Activities Report March 2015" dated 30 April 2015 which are available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.



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Name	Company	Contact
George Bauk	Managing Director / CEO Northern Minerals	+ 61 8 9481 2344
Mark Tory	Chief Financial Officer Northern Minerals	+ 61 8 9481 2344

### About Northern Minerals:

Northern Minerals Limited (ASX: NTU; Northern Minerals or the Company) is focussed on the delivery of the heavy rare earth (HRE) element, dysprosium. The Company has a large landholding in Western Australia and the Northern Territory that is highly prospective for this element. Through the development of its flagship project, the Browns Range Project (the Project), Northern Minerals aims to be the first significant world producer of dysprosium outside of China.

The Project is 100% owned by Northern Minerals and has a number of deposits and prospects containing high value dysprosium and other HREs, hosted in xenotime mineralisation. Dysprosium is an essential ingredient in the production of NdDyFeB (neodymium dysprosium iron-boron) magnets used in clean energy and high technology solutions. As a result of increasing global demand for these applications dysprosium supply is critical.

The xenotime mineralisation is rich in dysprosium and other high value HREs, and this in combination with the mainly silica host rock, provides a key competitive advantage. It allows the ore to be significantly concentrated, up to 30 times through the beneficiation stage, with excellent recoveries. Northern Minerals has undertaken extensive testwork to develop a two stage process flowsheet, consisting of a beneficiation and hydrometallurgical plant, to produce a high value, high purity dysprosium rich product.

Exploration continues at Browns Range (WA and NT), and is also underway at the geologically similar John Galt and Boulder Ridge projects. For more information visit [northernminerals.com.au](http://northernminerals.com.au)



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