



## SX Pilot Plant feed verifies leach recovery process

Peak Resources Limited (Peak; ASX: PEK; OTCQX: PKRLY), the developer of one of the world's largest rare earth deposits, is pleased to report that ANSTO Minerals (Australian Nuclear Science and Technology Organisation) has completed preparation of feed material for the Ngualla solvent extraction (SX) Pilot Plant.

The work was achieved using the simple sulphuric acid leach recovery process to treat a 1.3 tonne bulk sample of Ngualla rare earth mineralisation, which further verifies the robustness of the process flow sheet.

The ability to produce separated high purity products adds significant value to the project and allows access to wider markets for Ngualla's products.

### Highlights:

- An average 83% recovery of rare earths in the acid leach stage was achieved from the bulk sample.
- The work independently verifies the 'Proof of Concept' simple acid leach recovery flowsheet at a larger scale using a bulk composite of weathered Bastnaesite Zone rare earth mineralisation from Ngualla.
- The rare earth chloride feed solution produced is exceptionally pure with thorium and uranium levels below detection limits.
- An optimisation program on the acid leach and purification flowsheet is expected to improve process efficiencies further and Peak has commissioned ANSTO to complete this work.
- The SX Pilot Plant remains on track to deliver four separated >99% purity rare earth oxide (REO) products successively over the next few months with the final product delivered by mid-2013.
- In addition to providing product samples and specifications for assessment by potential off take customers, the work will provide detailed engineering data for the design of the full scale SX plant for inclusion in the Pre-Feasibility Study currently in progress.
- The SX Pilot Plant work will confirm the end to end process of Ngualla mineralisation to high value products, demonstrating the de-risking of the project, and is a major step toward achieving production in early 2016.

Peak Managing Director Richard Beazley said *"The independent verification of the Ngualla process flowsheet by ANSTO Minerals further demonstrates that Peak has a robust and reliable metallurgical treatment process that works for the weathered Bastnaesite mineralisation at Ngualla. Completion of the SX Pilot Plant work will place Peak amongst a very select few companies to have successfully produced high quality purified rare earth products."*

## Technical Report

The solvent extraction SX Pilot Plant work at ANSTO is designed to deliver four high purity (>99% REO) separated products from a rare earth chloride solution generated from Ngualla Bastnaesite Zone mineralisation. The chloride solution is generated using Peak's proven simple sulphuric acid leach process. The work will:

- confirm the end to end hydrometallurgical process to take Ngualla mineralisation to high rare earth value products
- provide engineering data for detailed plant design for input into the Pre-Feasibility Study
- provide products in sufficient quantity for assessment by potential off take customers.

### Feed Preparation

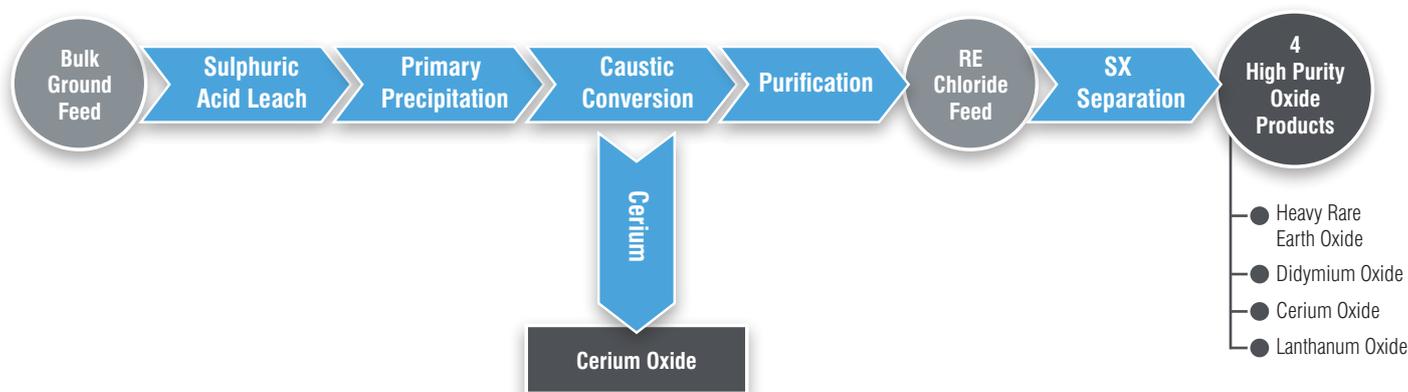
A bulk sample of approximately 1.3 tonnes of weathered rare earth mineralisation collected from 16 drill holes and 160 individual one metre samples within the Bastnaesite Zone at Ngualla was stage crushed and ground to 80% passing 106microns.

ANSTO leached the blended material in sulphuric acid over a 4 day campaign using a series of 3 batch leach tanks and a filter press. In total about 5,200 litres of filtrate was collected with the majority then processed through double sulphate precipitation in a continuous circuit that ran for approximately one day. After this primary precipitation, the solid was recovered by filtration.

Approximately 193kg of rare earth double sulphate was produced before undergoing caustic conversion and cerium removal (Figure 1). A total of 95% of the cerium was removed early as cerium oxide. This is a marked improvement on what was achieved for the Scoping Study and will ultimately result in a smaller and more cost effective downstream separation plant.

A total of 241 litres of high grade rare earth chloride solution was produced after a purification process as feed to the SX separation Pilot Plant. Contaminants in this purified solution are extremely low with thorium and uranium both below the 1ppm assay detection limit. Other contaminants such as iron, aluminium and magnesium are well below problematic levels for SX feed solutions.

**Figure 1: Simplified flowsheet of hydrometallurgical process for SX Pilot Plant feed preparation.**



ANSTO have also been commissioned to optimise the leach recovery and purification process to further improve stage recoveries and lower reagent costs. The results of this work will feed into the Pre-Feasibility Study and revised economic assessment currently in progress and due to be completed in Q3 2013.

### SX Pilot Plant

The SX Separation Pilot Plant operation is being conducted at ANSTO's new Solvent Extraction Facility. This facility is "state of the art" and will provide engineering data required for the Pre-Feasibility Study.



ANSTO Minerals Rare Earth Separation Facility.

The SX Pilot Plant will also produce four targeted rare earth products each of greater than 99% purity:

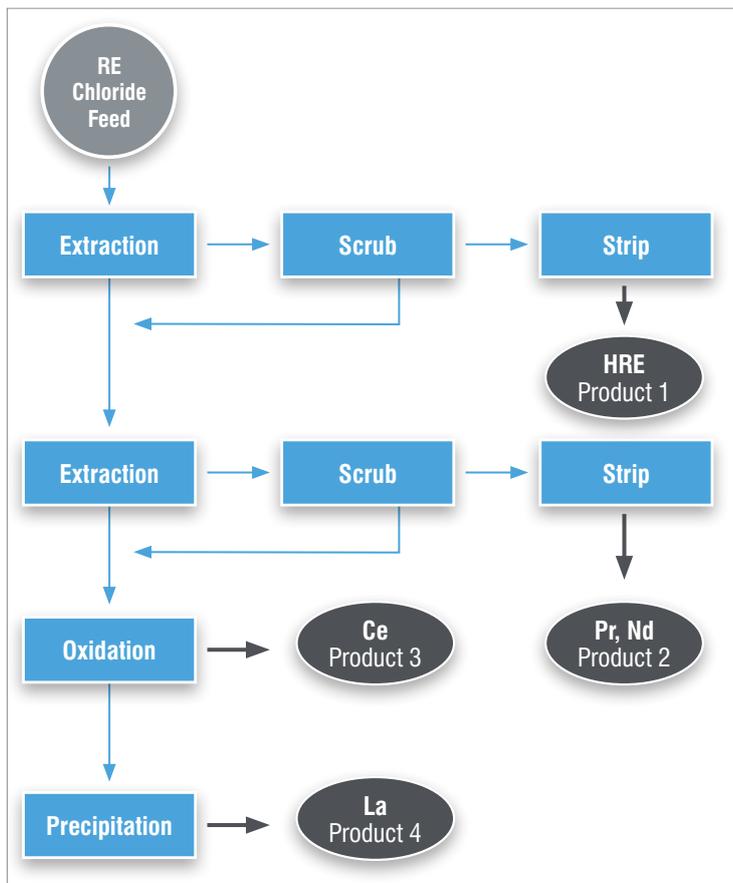
- **Heavy REO Mix**  
(Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and Y)
- **Didymium Oxide** – Praseodymium and Neodymium Oxide mix
- **Cerium Oxide**
- **Lanthanum Oxide**

These four products are chosen to meet the different applications of rare earths and the needs of end users and consumers.

The first stage of the SX Pilot Plant (Figure 2) is to recover the heavy rare earths (HRE), samarium to lutetium and yttrium, from solution. These rare earths will subsequently be purified before being recovered to produce a mixed HRE oxide product of greater than 99% purity. This first HRE product is scheduled for completion early in Q2 2013.

The other three products will be produced successively over the next few months with the final lanthanum oxide product scheduled to be delivered by mid-2013.

**Figure 2: Simplified flowsheet of SX Pilot Plant separation process into four high purity product streams**



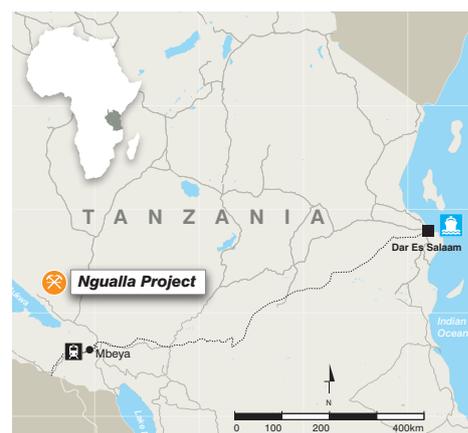
## About the Ngualla Rare Earth Project:

The Ngualla Rare Earth Project in Tanzania is a recent discovery and is the highest grade of the large undeveloped rare earth deposits.

Fundamental geological aspects offer distinct advantages for development over other rare earth projects. These include the large size of the deposit, outcropping, high grade mineralisation amenable to open cut mining with low strip ratios, favourable mineralogy amenable to a relatively simple, low cost processing route and the lowest uranium and thorium levels of any major rare earth deposit in the world.

Using a 3.0% lower grade cut, the total Mineral Resource\* includes a higher grade zone of 40 million tonnes at 4.07% REO for 1.6 million tonnes of contained REO, largely located near surface in the Southern Rare Earth Zone.

\*See Table 1 for Mineral Resource classification details and Table 2 for breakdown of individual REO's



Location of Peak's 100% owned Ngualla Project, Tanzania.

The favourable characteristics of the central Bastnaesite Zone targeted for first production distinguish Ngualla from all other rare earth development projects and are reflected in the results of the Scoping Study and preliminary economic assessment released to the ASX on 3rd December 2012. These indicate very low capital and operating costs compared to other rare earth projects.

The Scoping Study confirmed Ngualla as a leading rare earth project with an estimated NPV of US\$1.57billion and pre-tax IRR of 53% for an initial 25 year mine life and mining of an 8.2 million tonne portion of the Indicated and Measured Mineral Resource within the Bastnaesite Zone with an average grade of 4.35% REO.

The Pre-Feasibility Study and revised economic assessment now in progress and scheduled for completion in Q3 2013 are expected to continue to significantly enhance these robust project economics through:

- Further beneficiation and hydrometallurgical process optimisation
- A revised Mineral Resource model to include high grade results from the 2012 drilling and scheduled for completion by end March 2013

A range of high purity separated rare earth oxide products from the SX Pilot Plant will be available for assessment by potential off take customers in Q2 2013.

Peak has appointed financial advisors to work with the Company in identifying and securing strategic partners to assist in funding the Ngualla Rare Earth Project through to production. Discussions have commenced and there has been some strong interest in the project.

The Company continues to fast track the development of Ngualla with the aim of becoming a low cost, long term producer of high purity rare earth oxide products by Q1 2016.



**Richard Beazley** Managing Director

The information in this report that relates to Metallurgical Test Work Results based on information compiled and / or reviewed by Gavin Beer who is a Member of The Australasian Institute of Mining and Metallurgy. Gavin Beer is a Consulting Metallurgist with sufficient experience relevant to the activity which he is undertaking to be recognized as competent to compile and report such information. Gavin Beer 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 report that relates to Mineral Resources is based on information compiled by Rob Spiers, who is a member of The Australasian Institute of Geoscientists. Rob Spiers is an employee of geological consultants H&S Consulting Pty Ltd. Rob Spiers has sufficient experience which is 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Rob Spiers 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 report that relates to Exploration Results is based on information compiled and/or reviewed by Dave Hammond who is a Member of The Australasian Institute of Mining and Metallurgy. Dave Hammond is the Technical Director of the Company. He has sufficient experience which is 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dave Hammond consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

## Enquiries:

### Company

**Richard Beazley**

Managing Director

T: +61 (0) 8 920 5360

E: richard@peakresources.com.au

W: www.peakresources.com.au

### Media

**Ben Knowles**

Walbrook Investor Relations

T: +61 (0) 8 6189 2230

M: +61 426 277 760

E: ben.knowles@walbrookir.com.au

**Derek Gradwell**, SVP, Natural Resources

MZ Group – North America

T: +1 949 259 4995

E: dgradwell@mzgroup.us

W: www.mzgroup.us

## Appendix:

Table 1: Classification of Mineral Resources for the Ngualla Rare Earth Project, 1.0% and 3.0% REO cut-off grades (February 2012).

Lower cut – off grade	JORC Resource Category	Tonnage (Mt)	REO (%)*	Contained REO tonnes
1.0% REO	Measured	29	2.61	750,000
	Indicated	69	2.43	1,700,000
	Inferred	72	1.92	1,400,000
	<b>TOTAL</b>	<b>170</b>	<b>2.24</b>	<b>3,800,000</b>
3.0% REO	Measured	11	3.99	430,000
	Indicated	21	4.09	850,000
	Inferred	8.7	4.11	360,000
	<b>TOTAL</b>	<b>40</b>	<b>4.07</b>	<b>1,600,000</b>

REO (%) includes all the lanthanide elements plus yttrium oxides. Figures above may not sum precisely due to rounding. The number of significant figures does not imply an added level of precision.

Table 2: Relative components of individual rare earth element oxides (including yttrium) as a percentage of total REO for the Ngualla Southern Rare Earth and Northern Zones (&gt;1% REO).

	OXIDE		% OF TOTAL REO*
Light Rare Earths	Lanthanum	La <sub>2</sub> O <sub>3</sub>	27.1
	Cerium	CeO <sub>2</sub>	48.3
	Praseodymium	Pr <sub>6</sub> O <sub>11</sub>	4.74
	• Neodymium	Nd <sub>2</sub> O <sub>3</sub>	16.3
	Samarium	Sm <sub>2</sub> O <sub>3</sub>	1.65
Heavy Rare Earths	• Europium	Eu <sub>2</sub> O <sub>3</sub>	0.35
	Gadolinium	Gd <sub>2</sub> O <sub>3</sub>	0.78
	• Terbium	Tb <sub>4</sub> O <sub>7</sub>	0.07
	• Dysprosium	Dy <sub>2</sub> O <sub>3</sub>	0.17
	Holmium	Ho <sub>2</sub> O <sub>3</sub>	0.02
	Erbium	Er <sub>2</sub> O <sub>3</sub>	0.06
	Thulium	Tm <sub>2</sub> O <sub>3</sub>	0.00
	Ytterbium	Yb <sub>2</sub> O <sub>3</sub>	0.02
	Lutetium	Lu <sub>2</sub> O <sub>3</sub>	0.00
Other	• Yttrium	Y <sub>2</sub> O <sub>3</sub>	0.52
		<b>Total %</b>	<b>100</b>

(\* = Mineral Resource block model at 1% REO cut)

The blue markers (•) denote the five "critical rare earths", which are predicted to be in undersupply in the years ahead and predicted to command significantly higher value than other rare earths. (US DoE, 'Critical Materials Strategy' report, December 2011). The critical rare earths contribute the majority of the value from Ngualla at 56% of the in ground value. Of these, neodymium is the main single rare earth value driver, contributing 34%, (relative rare earth oxide prices: Metal Pages, 11th September 2012).