METALLURGICAL TESTWORK DELIVERS PREMIUM PHOSPHATE CONCENTRATE FROM CUMMINS RANGE

Results highlight potential to produce a valuable co-product, used in phosphate fertilisers

HIGHLIGHTS

- **Preliminary metallurgical testwork exceeds expectations for the production of a phosphate mineral concentrate as a potential co-product from Cummins Range.**
- **Outstanding results achieved, with greater than 39% P_2O_5 phosphate mineral concentrates produced with excellent recovery.**
- **Conventional phosphate flotation circuits tested, supporting a simple and proven beneficiation flowsheet for phosphate mineral recovery.**

RareX Limited (**RareX, the Company**) (ASX: REE) is pleased to report positive outcomes from a testwork program conducted on samples from its 100%-owned Cummins Range Rare Earths Project (**the Project, Cummins Range**), located in the Kimberley region of WA.

The testwork was led by RareX with support from other consultancies, with results confirming the potential to produce a premium-grade phosphate concentrate of >39% P_2O_5 (well above the benchmark grade of 32% P_2O_5 used in phosphate fertiliser production) using a simple, proven beneficiation technique.

RareX Managing Director, Jeremy Robinson, said: *"This testwork supports the opportunity to produce a premium and highly-valuable phosphate co-product at Cummins Range as part of our rare earths business, with the potential to help drive very low cash operating costs as demonstrated in the recently released Scoping Study."*

INTRODUCTION

The Cummins Range Rare Earths Project is a globally significant rare earths project located in the Kimberley region of Western Australia near the township of Halls Creek. The Project has a JORC Indicated and Inferred 2012 Mineral Resource Estimate (cut-off grade 0.5% TREO) containing 18.8 million tonnes of 1.15% TREO and 10% P_2O_5 with a high neodymium and praseodymium (NdPr) to TREO ratio of 20%[1].

The primary rare earth mineral is monazite hosted in the weathered portion of the underlying carbonatite intrusion with the deposit outcropping in multiple locations. Recent exploration activities have discovered high-grade phosphate mineralisation in the northern zone.

[1] ASX Announcement 19 July 2021: RareX delivers major resource upgrade at Cummins Range Rare Earths Project.

Phosphate minerals (primarily apatite) have been identified in both the rare earth zone and phosphate zone within the Cummins Range deposit. The phosphate material is found to be hosted in carbonatite and is believed to be premium grade compared to typical sedimentary deposits, offering outstanding potential to produce a phosphate mineral concentrate of >31% P_2O_5 with simple beneficiation. Phosphate concentrate is a key input for phosphorus fertiliser production and has the potential to significantly enhance the overall project economics as a valuable co-product.

PHOSPHATE SIGHTER FLOAT PROGRAM

To investigate the potential of phosphate minerals recovery, a sighter flotation program was undertaken at Auralia Metallurgy in Perth.

The primary goal of this metallurgical testing program was to demonstrate that a high grade, commercially viable phosphate mineral concentrate could be produced using a simple flotation process.

Flotation Results

The sighter testwork program was centred on the production of a phosphate mineral concentrate, with testwork undertaken on two composite samples collected from the Cummins Range Project, namely:

1. CDX0015 Phosphate Zone Fresh Composite
2. CDX0015 Phosphate Zone Regolith Composite

Both composite samples were subjected to a flotation test with the same circuit configuration, i.e., 3-stage rougher flotation followed by 2-stage cleaner flotation. A summary of the flotation testwork results are shown in Table 2.

Table 1: Flotation Results Summary

Product	CDX0015 Fresh		CDX0015 Regolith	
	P_2O_5		P_2O_5	
	Grade %	Recovery %	Grade %	Recovery %
Rougher Concentrate	31.0	94.4	23.8	94.3
Cleaner Concentrate FINAL	**39.1**	**80.3**	**34.1**	**85.7**
Head Grade	13.4	-	12.8	-

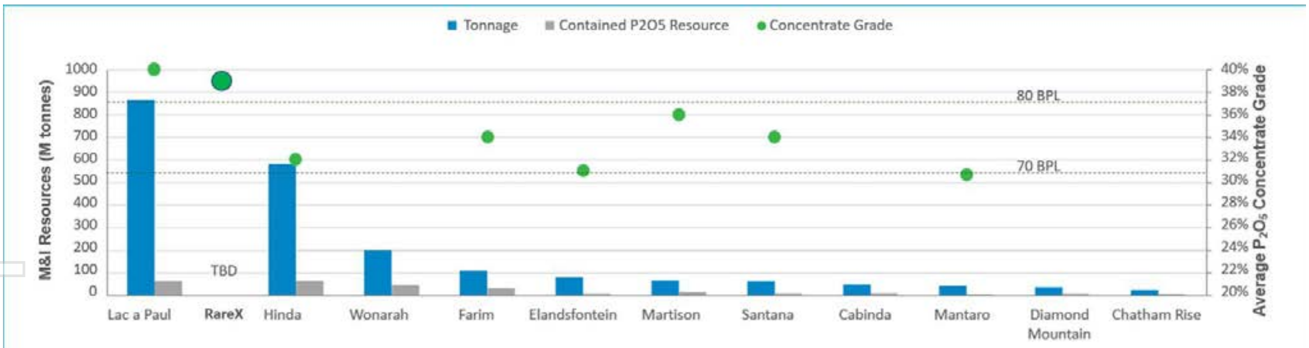
As demonstrated in the table above, excellent results were achieved from the testwork program, exceeding the primary goal of producing a phosphate mineral concentrate of greater than the benchmark 31% P_2O_5 grade. The P_2O_5 grade in the cleaner concentrate was 39% and 34% for the CDX0015 Fresh Composite and CDX0015 Regolith Composite respectively. The P_2O_5 recoveries were also promising for both samples. These results have further demonstrated the potential of producing a premium phosphate mineral concentrate co-product from the Cummins Range deposit.

Following these initial positive flotation results, the next phase of the phosphate mineral beneficiation testwork will focus on grind size optimisation, further gangue suppression, flotation conditions and circuit configuration optimisation to ensure the technical and economic feasibility of the beneficiation flowsheet.

PHOSPHATE MARKET PRICING

The phosphate market is very large market with approximately 200Mt of rock phosphate currently mined and traded annually, with most being mined in North Africa (Morocco, Jordan, Tunisia) and Russia. The most referenced price is the Moroccan 68-72% BPL "Bone Phosphate of Lime" FOB price. 68-72% BPL is equivalent to 31-33% P_2O_5. Premium phosphate is also traded at 78-87% BPL mostly from the Kola Peninsula in Russia which is equivalent to 36-40% P_2O_5 and trades at a significant premium to the published Moroccan price.

As shown in the graph below, there are currently few projects globally that can produce at 78-87% BPL.



Lac a Paul	RareX	Hinda	Wonarah	Farim	Elandsfontein	Martison	Santana	Cabinda	Mantaro	Diamond Mountain	Chatham Rise
QC, Canada FS	AU FS	ROC FS	Australia FS	Farim FS	South Africa Construction	ON, Canada Adv. Exp.	Brazil FS	Angola PEA	Peru Adv. Exp.	UT, U.S.A. Adv. Exp.	New Zealand FS

Figure1: Largest Undeveloped Phosphate Projects Not Owned by a Major Fertilizer Producer[2]

2 Source: Arianne-inc.com company reports and RareX company information and market insights

This announcement has been authorised for release by the Board of RareX Limited.

Competent Person's Statements

The information in this release that relates to metallurgical testwork is based on information compiled and / or reviewed by Mr Gavin Beer who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM) and a Chartered Professional. Mr Beer is a consulting metallurgist with sufficient experience relevant to the activity which he is undertaking to be recognised as competent to compile and report such information. Mr Beer consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. Mr Beer does not hold securities in RareX.

Prior exploration results were reported in accordance with Listing Rule 5.7 and the Company confirms there have been no material changes since the information was first reported.

The mineral resource estimate in this announcement was reported by the Company in accordance with Listing Rule 5.8 on 19 July 2021. The Company confirms it is not aware of any new information or data that materially affects the information included in the previous announcement and that all material assumptions and technical parameters underpinning the estimates in the previous announcement continue to apply and have not materially changed.

Appendix 1: Drill Collar Table

Hole ID	East MGA	North MGA	RLUTM	End Depth (m)	Azimuth	Dip	Type
CDX0015	307372	7866769	393	204.6	50	60	Diamond

Appendix 2: JORC Code, 2012 Edition – Table 1

Section 1: Sampling techniques and data - Metallurgy

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	• Both RC chips and diamond drill cores were sampled for the phosphate metallurgical testwork. Samples were selected based on drill assays, drill hole location and intervals, geological and mineralogical data. Samples were riffle split from bulk samples and sent to Auralia Metallurgy in Perth and/or Nagrom Perth and/or ALS Perth for assays and further testwork.
	• Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	• For RC chips, the entire bulk samples were riffle split to ensure a representative sample from the selected interval. For diamond drill cores, half core was sent to a laboratory to conduct crushing, sampling and assaying. All laboratories used in the assaying of the Cummins Range material were checked for sampling and assaying equipment and equipment calibrations / accuracy.
	• Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• Sample interval selection for the metallurgical testwork was based on geological controls and mineralisation of the deposit, the samples were considered representative of the mineralisation that were intended to be tested.
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• Drilling techniques used for the Cummins Range samples used for the metallurgical testwork were: o Reverse Circulation (RC) drilling in 2020-2021 using 5 ½ inch diameter hammer. o Diamond drilling in 2021- 2022 using HQ and PQ sized rods.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed.	• Samples used for the metallurgical testwork were collected by riffle split. Additional laboratory assays were undertaken on the samples submitted for the testwork and showed good alignments to the drill assays.
	• Measures taken to maximise sample recovery and ensure representative nature of the samples.	• Larger and more capable rigs were used for collection of the metallurgical samples which allowed for good recoveries of samples. During each drill program, all drill rigs were checked by professional geologists, and all drill holes were logged and monitored for recoveries and accuracy prior to sample splitting and logging.
	• Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Holes used for the metallurgical testwork had good sample recovery hence minor sample bias. There is no distinctive relationship exist between sample recovery and grade.
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	• All samples used for the metallurgical testwork were geologically logged to a detail level that supported the metallurgical studies.
	• Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	• The logging is qualitative and quantitative in nature for the metallurgy samples. The recorded details included; lithology, grainsize, weathering, colour, alteration, sulphide quantity and type, structure and veining. Photos were taken for all core samples.
	• The total length and percentage of the relevant intersections logged.	• Logging of all metallurgical samples were carried out on geological intervals.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken.	• Cores were cut in half and quarter, quarter cores from each selected interval were used for this sighter metallurgical testwork.
	• If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	• RC chips were riffle split from the bulk bags. Samples were dry when riffle split.
	• For all sample types, the nature, quality and appropriateness of the sample preparation technique.	• Samples used for the metallurgical testwork included RC and diamond drill cores which were split and prepared with appropriate equipment. Where required, the samples were crushed / ground and/or chemically treated to ensure the samples were properly prepared for the required testwork.

Criteria	JORC Code explanation	Commentary
	• Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	• All sample preparation and sampling equipment was cleaned with adequate procedures before taking of each sample to ensure there is no cross-contamination between samples.
	• Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.	• Drill assays, mineralogical and geological information were reviewed for selection testwork samples. Additional assays on the samples showed high repeatability of drill assays suggesting good representivity of the in-situ material hence no further sampling was required.
	• Whether sample sizes are appropriate to the grain size of the material being sampled.	• The metallurgical sample sizes were appropriate to the grain size of the material being sampled. Where necessary, material was crushed and/or pulverised before riffle / rotary split to ensure good consistency of sampling representivity.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	• The assay analyses of all samples were conducted by registered laboratories (i.e., ALS and Nagrom etc.) with suitable equipment and well-known quality assurance accreditation to ensure the accuracy of the assay results. Samples were assayed by X-ray fluorescence (XRF) and Inductively Coupled Plasma (ICP).
	• For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	• There was no reliance upon geophysical tools, spectrometers, or any other techniques for the required metallurgical testwork apart from the use of a portable XRF to quickly track the progress of metallurgical tests. These XRF results were later confirmed with ICP analysis at the laboratory. The XRF had been calibrated for very elevated levels of REE and phosphate. System checks, blanks and standards were analysed before any PXRF readings were taken.
	• Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	• The metallurgical samples were tested against the standards and the good alignments to drill assays confirmed the accuracy of the results. Bench-top XRF assays were also verified with additional ICP assays and the XRF equipment was further calibrated to ensure the precision is well established.
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel.	• There are no significant intercepts mentioned in this announcement.
	• The use of twinned holes.	• Twin holes were not used for collection of metallurgical samples.
	• Documentation of primary data, data entry procedures, data verification, data storage	• An electronic geological database was used for data storage. For metallurgical testwork, all raw

Criteria	JORC Code explanation	Commentary
	(physical and electronic) protocols.	data from laboratories, results analysis and summary reports were documented in a metallurgy database.
	• Discuss any adjustment to assay data.	• No adjustment was made to the assay data.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	• Drill hole collar locations for the metallurgical testwork have been surveyed using a differential GPS with accuracy to 0.1 m.
	• Specification of the grid system used.	• GDA94, MGA Zone 52
	• Quality and adequacy of topographic control.	• Drillhole collar locations for the metallurgical testwork have been surveyed using a differential GPS with accuracy to 0.1m.
Data spacing and distribution	• Data spacing for reporting of Exploration Results.	• The regolith samples were mainly collected from three drill holes that were spaced out over ~120 m x 180 m of the deposit and were ranging from 0 m down hole to 112 m down hole. For the fresh core samples, the drill holes that the metallurgical samples came from were spread out over 400 m of strike and range from 70 m down hole to 285 m down hole.
	• Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	• The data spacing is considered appropriate for the metallurgical testwork at this study level.
	• Whether sample compositing has been applied.	• Samples were all composited for the metallurgical testwork. Representative portion of each selected intervals were sent to the designated laboratories to undergo staged crushing and grinding before being composited and homogenised with suitable equipment. Where drill cores were used for the testwork, half cores were crushed into suitable sizes before splitting the representative samples used for composition.
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	• The orientation of the metallurgical sampling is not considered to be biased towards any geological characteristics.

Criteria	JORC Code explanation	Commentary
	• If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• N/A
Sample security	• The measures taken to ensure sample security.	• All metallurgical samples were secured with appropriate labelling system. Samples were labelled with standard designations and were stored in locked shed. Samples were transported to Perth from site by reputable transport companies. Individual bags are cable tied and the pallets are wrapped in plastic with detailed logging sheet included.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• No audits were undertaken however the Competent Person was involved in all stages of the metallurgical sampling and tests. In-house reviews were also completed on the sampling techniques and testwork results.

Section 2: Exploration Results - Metallurgy

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.	• The Cummins Range deposit is located on tenement E80/5092 and is 100% owned by Cummins Range Pty Ltd which is a wholly owned subsidiary of RareX Ltd. Cummins Range Pty Ltd purchased the tenement from Element 25 with a potential capped royalty payment of AU$1m should a positive PFS be completed within 36 months of purchase finalisation.
	• The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• No security or impediments with tenement E80/5092
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• CRA Exploration defined REO mineralisation at Cummins Range in 1978 using predominantly aircore drilling. Navigator Resources progressed this discovery with additional drilling after purchasing the tenement in 2006. Navigator announced a resource estimate in 2008. Kimberly Rare Earths drilled additional holes and upgraded the resource estimate in 2012.

Criteria	JORC Code explanation	Commentary
Geology	• Deposit type, geological setting and style of mineralisation.	• The Cummins Range REO deposit occurs within the Cummins Range carbonatite complex which is a 2.0 km diameter near-vertical diatreme pipe that has been deeply weathered but essentially outcropping with only thin aeolian sand cover in places. The diatreme pipe consists of various mafic to ultramafic rocks with later carbonatite intrusions. The primary ultramafic and carbonatite rocks host low to high grade rare earth elements with back ground levels of 1000-2000 ppm TREO and high grade zones up to 17% TREO. The current resource sits primarily within the oxidised/weathered zone which reaches to 120m below the surface. Metallurgical studies carried out to date show that the rare earth elements are primarily hosted by Monazite which is a common and favourable host for rare earth elements.