

# PROSPECT ANNOUNCES EXPLORATION FOR RARE EARTHS AT CHISHANYA CARBONATITE

# **Prospect announces the commencement of exploration at its Chishanya carbonatite project in southeastern Zimbabwe**

# Highlights:

- Chishanya carbonatite project is prospective for REE mineralisation
- Previous work has identified apatite-hosted phosphate on the project
- Prospect holds 10 exploration licences across 2.2km<sup>2</sup> of main deposit
- Prospect recently raised A\$10m to further their exploration efforts and advance their flagship Arcadia Lithium Project
- Prospect also holds options for the Good Days Lithium and Tombolo Cobalt projects in Zimbabwe and DRC respectively
- Company is positioning itself as a leading explorer for battery metals

Prospect Resources Ltd (ASX: PSC) (the "Company") is pleased to announce that it is preparing to commence exploration at its Chishanya carbonatite project in the southeast of Zimbabwe, with a focus on determining the Rare Earth Element ("REE") potential of the site. Previous work carried out by the Company at the project was focussed on identifying copper mineralisation as well as the phosphate potential within apatite, and has not been assessed before for its REE potential.

### **Chishanya Project**

The project is located close to good infrastructure and the operating IDC Phosphate Mine at Dorowa (Figure 1). Prospect's permits cover the central portion of Chishanya Hill, as well as the ground immediately north and west of it (see Figure 2 for topography of project). Carbonatites are igneous rocks comprised over 50% carbonate minerals. Typically, they form circular plugs, with zoned variable alkalic rocks and associated cross cutting dykes and often show extensive wall-rock alteration.





Figure 1. Ikonos satellite imagery (band 321) of Chishanya project area, and approximate location of Prospect's permits around Chishanya Hill

Many of them host significant abundances of apatite, magnetite, barite and fluorite that may contain anomalous concentrations of phosphates, REEs, niobium, uranium, thorium, fluorite, barite, vermiculite and occasionally copper. The REEs occur in minerals such as bastnaesite, allanite, apatite and monazite. The carbonatite at Chishanya has not been investigated before for its potential as a host for this suite of mineralisation, though apatite mineralisation has been mapped and assayed for its phosphate potential.

### Chishanya Carbonatite

The Chishanya carbonatite lies in the Buhera district in the southeast of the country, 25km north of Birchenough Bridge.

Prospect holds 10 claims forming just over 220 hectares, covering the majority of the carbonatite complex here

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The deposit comprises a Lower Cretaceous (127 Ma) carbonatite complex with an approximate width of 1.5km and a length of 5km, striking north – south (see Figure 3). The carbonatites (mainly coarse calcium rich sövites) form arcuate dyke like bodies intruded with alternating layers of ijolite, fenite and foyaite. Thin layers and stringers of magnetite and apatite occur within the sövites, which can in parts reach 2- 3m width. The surrounding hills contain lenses of late-stage dark brown Fecarbonatite, rich in magnetite and apatite.

Figure 2. Topography of Chishanya Hill

#### Exploration

Prospect's exploration programme has been designed to efficiently evaluate the REE potential of the Chishanya permits. A Phase 1 RC scope drilling programme will concentrate on testing the hard rock potential of Chishanya Hill, targeting the interpreted extensions of the apatite-magnetite lenses and iron carbonate bands exposed on surface.

Previous work at the licence concentrated on near surface exploration for Palabora-style copper mineralisation, with only two boreholes ever having been drilled into the main hill by IDC in 1968 (locations seen in Figure 3). It should be noted that these holes were drilled primarily to test for Palabora style copper mineralisation, which is not present at Chishanya.

Anomalously high phosphate values of up to 15% P<sub>2</sub>O<sub>5</sub> were returned from historical surface trenching by the Miekle family and subsequently selective mining of the 2-3 m wide apatite-rich dykes at Baradanga Hill was considered for fertiliser by Barber in 1991. This area was estimated to contain 1,600 tonnes of ore per metre depth with an average grade of 8% P<sub>2</sub>O<sub>5</sub>. No detailed mineralogical studies of the phosphate-rich zones have been carried out. Also, no agronomic testing has been conducted on this phosphate resource. These apatite-rich dykes now form some of the main targets for this renewed phase of exploration and will be investigated for their REE, uranium, scandium, yttrium and niobium potential, and Prospect also intend to reassess the resource potential for phosphate fertiliser.

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Figure 3. Geological map of Chishanya Hill showing carbonatite locations

### Planned Prospect Resources Work Programme

PR proposes to undertake a limited scope drilling programme to test the economic potential of the hard rock deposit that forms Chishanya Hill. Should the drilling indicate the presence of significant mineralisation then an infill drilling programme would be undertaken to increase confidence in the resource.

- Phase 1 Scoping Study. Channel chip samples across phosphate bands on Chishanya and Southern Baradanga First pass analysis by XRF-Niton, repeat assaying at ALS-Chemex in Johannesburg.
- Scope drilling of anomalies with track-mounted RC rig. 10 x 100m deep holes on 100m grid. (Approx 1,000m). The purpose of this is to test the REE, niobium, uranium and phosphate contents.
- Phase 2 Infill Resource Definition Drilling. Assuming positive results from Phase 1 then an infill RC drilling programme of around 5,000m will be drilled on an approximately 50m grid.
- 10% of the holes to be repeated with DD drilling to test depth extent and obtain samples for mineralogical & metallurgical test work. (5 x 100m holes =>500m).



### **REE Potential**

Rare Earth Elements ("REEs") refers to a group of 17 chemically-similar elements, including the 15 elements in the Lanthanide Series, and also scandium and yttrium because of their similar properties. The REEs are chemically and physically very similar, which historically made separation of the individual REEs from each other fairly difficult as they can easily substitute for each other in. REEs are divided into two groups: light rare earth elements ("LREE", lanthanum to europium) and heavy rare earth elements ("HREE", gadolinium to lutetium and yttrium) based on their atomic weight. A further grouping termed critical rare earths ("CRE") has been established based on their importance to clean energy and potential supply risk. This has been supplemented to a certain extent by a grouping of rare earths used in the high strength permanent magnet sector which currently has the most favourable supply demand outlook.

REEs do not occur naturally as metallic elements. Rather they occur in a wide range of minerals, including halides, carbonates, oxides, phosphates and silicates. More than 200 minerals are known to contain REEs, but only three minerals tend to carry economic concentrations: bastnasite, monazite and xenotime. The most commercially important REE deposits globally are associated with magmatic processes and occur in, or related to, alkaline igneous rocks or carbonatites, such as seen at Chishanya in Zimbabwe and Songwe Hill in Malawi. Songwe Hill is a carbonatite-hosted REE project, which is being advanced by Mkango Resources who recently raised C\$10.5M for their feasibility study. Another carbonatite deposit, Mountain Pass in the USA, was the main source of REEs throughout the 1970s and 80s (source: USGS).

### Why REEs?

REEs are used in small quantities in a variety of high technology growth industries. They are used to make powerful permanent magnets for lightweight electric motors, phosphors for TV monitors, catalysts for cars and chemical refineries, rechargeable batteries for hybrid and electric cars, generators for wind turbines, as well as numerous optical, medical and military devices. Many of these applications are highly specific and substitutes for the REE are inferior or unknown, so the REE have acquired a level of technological significance much greater than expected from their relative obscurity.

The REE sector has been dominated for decades by China, who currently control over 90% of the world's supply (see Figure 4) but as the market continues to grow steadily their dominance is slipping and there is recognised strategic benefit in discovering REE sources outside of China. The outlook for dysprosium & neodymium, which are used in magnets in electric motors, seems to be particularly positive. Prices for neodymium and praseodymium oxide rose over 80% in 2017 (source: agmetalminer.com/).





Figure 4. Projected REE production for China and ROW 2013 - 2018 (source: Statista)

The principal markets for REEs are as follows:

- Magnets: key applications for permanent magnets include industrial motors, hard disc drives and automotive applications. As the market for electric vehicles and hybrids grows, and also wind turbines and other forms of renewable energy storage are required, the demand for permanent magnets is expected to grow significantly – driving demand for REEs within them.
- Batteries: nickel metal hydride batteries are used extensively in portable tools and also in hybrid vehicles. Some lithium ion batteries also contain substantial amounts of REEs, which are not currently recycled due to the expense of extracting them.
- Metallurgy: REEs are used to improve the mechanical characteristics of alloyed steel and in desulphurisation.
- Catalysts: REEs are used in catalysts, such as in catalytic converters in cars.
- Industrial: REES are often used as polishing powders and glass additives, and for decolourisation and removing impurities.
- Phosphors: REEs are an important constituent of tri-band phosphor lighting used in fluorescent tubes and lamps as well as LCD backlights for flat panel displays.
- Other applications for REEs include ceramics, fibre optics and lasers.



The market with the strongest growth potential is thought to be that of permanent magnets, and this is projected to continue as the demand for electric vehicles and renewable energy capture continues.

The potential for the carbonatites at Chishanya to host REE mineralisation represents an exciting opportunity for Prospect Resources. The team will assess the site's potential through an efficient exploration programme, and will rapidly determine whether to progress to Phase 2 of the programme. If the REE potential at Chishanya is recognised, this will be a fantastic addition to Prospect's strategic portfolio of projects for high-tech battery metals.

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### **Competent Person's Statement**

The information in this announcement that relates to exploration results is based on information compiled by or under the supervision of by Mr Roger Tyler, a Competent Person who is a member of The Australasian Institute of Mining and Metallurgy (AUSIMM) and The South African Institute of Mining and Metallurgy (SAIMM). Mr Tyler is the Company's Chief Geologist. Mr Tyler has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results. Mr Tyler consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.