Xcalibur
SMART MAPPING

Critical Mineral – REEs Projects

Xcalibur Smart Mapping

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Unlocking Natural Capital

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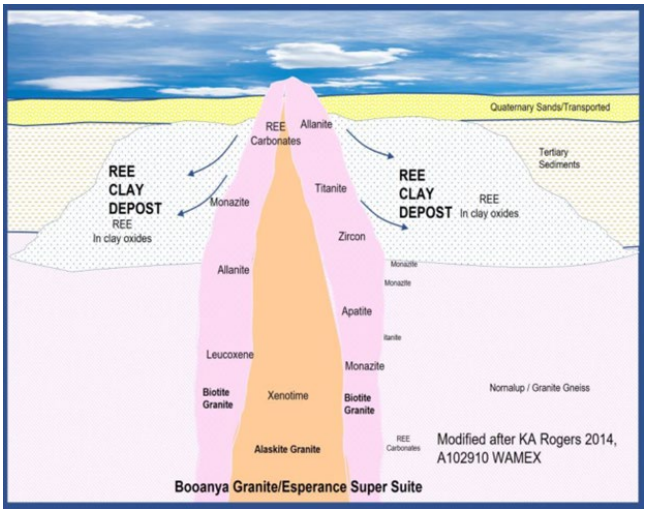
The Splinter Rock Clay Hosted Rare Earth Project, Esperance, WA, Australia.

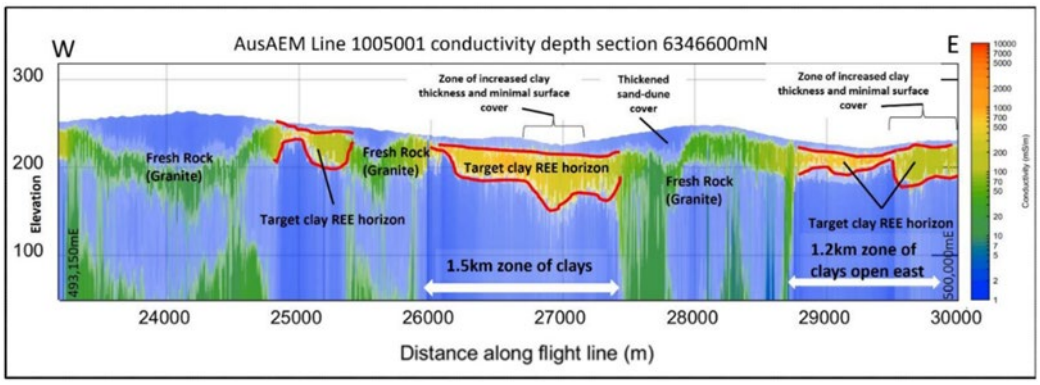
OD6 Metals is a junior Australian company focussed on exploration for rare earth elements (REE) on several projects located near Esperance, approximately 700km east of Perth, Western Australia. The projects are prospective for clay-hosted REE deposits, considered to be formed from weathering of REE-rich Booanya granites in the area. See metallogenic model below.



Splinter Rock Metallogenic Model. Ref:OD6 presentation to ANU Rare Earth Conference, 02 Nov.2022

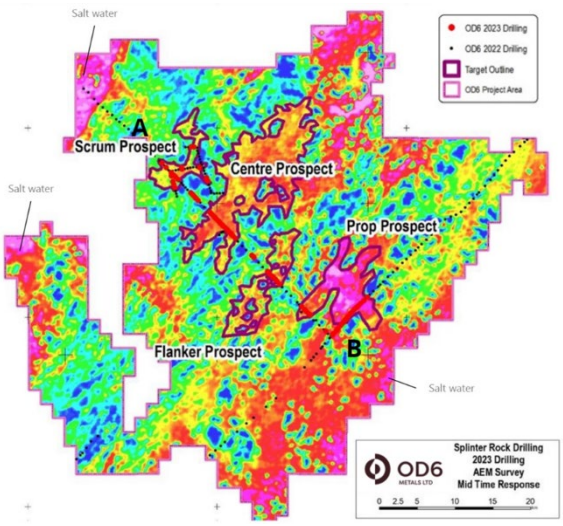
Clay-hosted REE deposits are attractive exploration targets as they can provide a high margin REE product with low capital requirement. The geology of clay hosted REE deposits, with more conductive clays contrasting with more resistive un-weathered rocks, can also be conducive to fast and efficient mapping with a quality airborne electromagnetic system, such as Xcaliburs' TEMPEST® technology.

In collaboration with CSIRO, OD6 analysed existing regional TEMPEST® airborne electromagnetic data acquired across their project in 2020 during Geoscience Australia country wide AusAEM survey. The assessment showed that the TEMPEST® AEM data can "map clay thicknesses and deep channels that are targets and identify sub-cropping fresh rock or thick sand-dunes to be avoided".
Ref: OD6 ASX Announcement 05 Oct 2022
https://www.od6metals.com.au/wp-content/uploads/2022/10/61113722.pdf



With the success in mapping the target clay horizons using the regional TEMPEST® profiles, OD6 commissioned Xcalibur to survey over 4,600km^2 of tenements with the TEMPEST® system, mostly at 400m line spacing. The TEMPEST® successfully mapped of clay location, extent, and thickness, with over 250km2 of clay basins mapped.

In the TEMPEST® AEM data image below, the conductive clays are readily mapped and shown in yellow to red colours. These areas are prioritised as exploration targets, and OD6 reported 73 out of 83 holes in a drill program targeted by the TEMPEST® data returned significant TREO results; a success rate of 90%. Un-weathered rocks, thick sand dunes, and other non-prospective geology are more resistive. These are mapped by TEMPEST in blue to green colours and can be avoided in the exploration workflow.



Ref: OD6 Presentation to RIU Sydney Conference 09 May 2023

Summary

Technical Success – continued excellent correlation between interpretation of TEMPEST® AEM data and REE widths and grades.

Commercial Success – vast area covered, accelerated exploration / development, cost/time savings by focussing on high potential qualified drill targets.

A maiden mineral resource estimate of 344Mt @ 1,308 TREO (Praseodymium, neodymium, Turbium and Dysprosium) was released in July 2023.

ESG Success – no ground access, reduced invasive drilling, reduced soil sampling, reduced lab assays, focussed exploration on higher potential qualified areas, no safety incidents, minimal environmental impact.

Client Success – Client comments in press releases include:

- Brett Hazelden, OD6 MD: "Completion of the (TEMPEST AEM) survey is a milestone step in exploration activities across our vast tenure. Preliminary interpretation has focused on the four main high-grade rare-earth prospect areas at Splinter Rock with data processing and comparative analysis demonstrating very strong correlation with our current exploration model.
  Given the sheer scale of our tenure, mapping clays in this way enables optimisation of exploration activities through informed, targeted future drilling. With drilling showing clay thicknesses of between 10 to 30m at our high-grade prospects to date, the potential to expand and replicate this across the combined 253 square kilometres of target areas identified, suggests this could be the beginnings of defining a truly world scale project…..
  Ref: OD6 ASX Announcement 15 Dec 2022
  https://www.od6metals.com.au/wp-content/uploads/2022/12/61128524.pdf
- Brett Hazelden, Managing Director, commented:
  "… Our focus was to further test the significant length of these areas, whilst also determining the continuity of grade and thickness of clay extensions. We are delighted to confirm clay thicknesses initially observed, strongly correlate with, and validate, the Airborne Electromagnetic Survey data, providing our team with further confidence in our exploration methodology….
  Ref: OD6 ASX Announcement, 15 Aug 2023
  https://www.od6metals.com.au/wp-content/uploads/2023/08/61163193.pdf

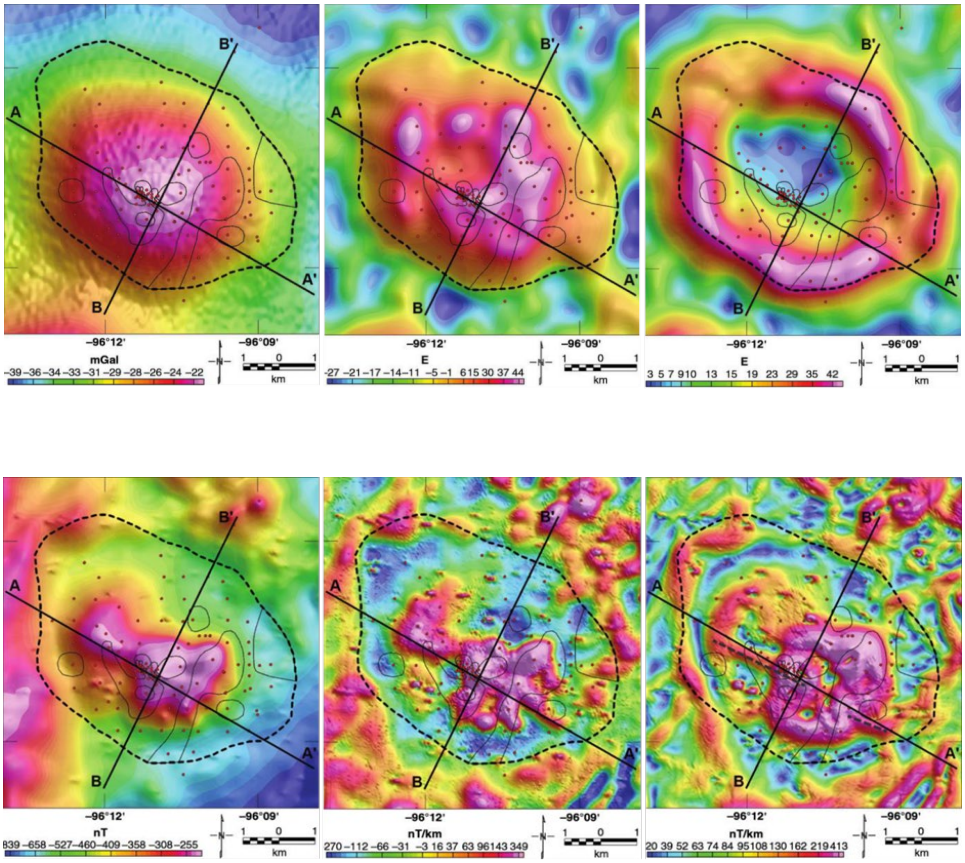
The Elk Creek Carbonatite Niobium-REE Deposit, Nebraska, USA.

FALCON® AGG data is used to map rock types, intrusives, structures and fault systems that influence placement of REE resources from surface to depths of many kilometres underground.

In 2012 a FALCON® AGG survey was used to map the Elk Creek carbonatite, an intrusive complex buried under 200 m of sedimentary rocks in SE Nebraska, USA. The carbonatite hosts the largest known niobium deposit in the U.S. and significant rare earth element (REE) mineralisation.

Exploration of buried deposits require geophysical data to focus drilling. Gravity and magnetic methods are often useful for studying alkaline igneous systems such as carbonatites because they typically have anomalous physical properties (density and magnetic susceptibility) compared with country rocks.

The FALCON® AGG survey acquired high-resolution AGG and magnetic data over 1,176km of line survey data collected in a region of about 110 km^2. The survey was flown at a nominal terrain clearance of 100 m, and with a line spacing of 100 m. The gravity and magnetic data, and vertical and horizontal gradients of each shown below.



FALCON® AGG data mapping the geology and structure of the Elk Creek carbonatite, Nebraska, USA.(Adapted From Drenth 2014)
UPPER - Left – Bouguer Gravity, Centre - Vertical Gravity Gradient (G_{zz}), Right - Horizontal Gradient (HGM) of gravity
LOWER – RTP Magnetic, Centre - Vertical Gradient of RTP, Right - Horizontal Gradient Magnitude (HGM) of RTP

The FALCON® AGG data images an ~12 mGal gravity and ~60 Eotvos (E) Gzz high, explained by a large density contrast between the carbonatite with the gneissic host rocks. The gravity high images the carbonatite body, while the vertical gravity gradient provides additional information on the internal structures within the carbonatite and the horizontal gravity gradient provides additional information on the margin of the carbonatite.

The FALCON® magnetic data shows a more subtle aeromagnetic anomaly because most of the carbonatite volume is weakly magnetized, and locally host rocks are more strongly magnetized than the carbonatite. (Drenth 2014). The carbonatite margin is well imaged by the horizontal magnetic gradient, with the derivative magnetic datasets providing additional structural information.
Drenth (2014) concluded geophysical, physical property and borehole data make a powerful combination for geologic interpretation for buried targets, and in the case of the Elk Creek Carbonatite, high-resolution geophysical data, physical property data, and legacy borehole data were combined to explain the carbonatite's geophysical expression because it relates to fundamental structure and mineralization.

Ref: Benjamin J. Drenth, (2014), "*Geophysical expression of a buried niobium and rare earth element deposit: The Elk Creek carbonatite, Nebraska, USA", Interpretation 2:SJ23-SJ33* https://library.seg.org/doi/abs/10.1190/INT-2014-0002.1
Kenneth Li, Xiaolong Wei and Jiajia Sun (2021) "Geophysical characterization of a buried niobium and rare earth element deposit using 3D joint inversion and geology differentiation: A case study on the Elk Creek carbonatite" SEG 1st Intl Meeting for Applied Geoscience and Energy, Extd Abst. https://doi.org/10.1190/segam2021-3585069.1