RAMP-HD: Rapid Airborne Mineral Prospecting - High Definition

CASE HISTORY

RAMP

Commodity: Rare Earth Elements (REE)

Location: Northern Saskatchewan

Project: Alces Lake

Client: Appia Rare Earths & Uranium Corp.

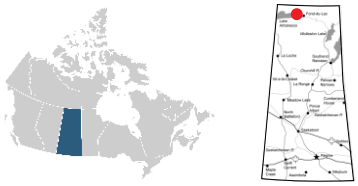


Fig. 1
Regional Geology, overlain with Appia's Alces Lake Project boundary (yellow) and 2021 fixed wing gamma ray-magnetic survey boundary (white). The 2021 survey was flown at 150-200 kph using east-west oriented lines spaced every 50 m.

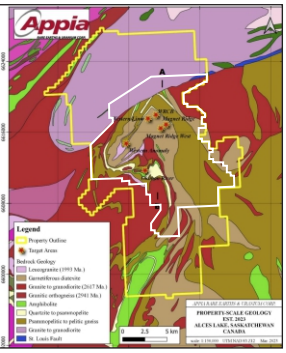


Fig. 2
2021 Fixed Wing Survey eThorium Map

Maps produced display broadly defined anomalies (based on 50m sample spacing along lines), each anomaly requiring many person-days to ground survey and sample. Anomalous sites not directly overflown by the 2021 survey may remain undiscovered.

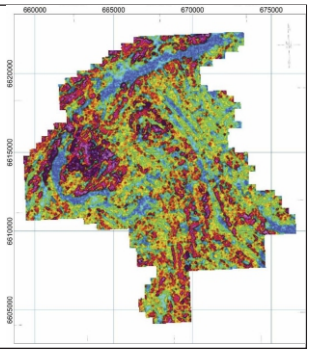


Fig. 3 RAMP-HD eThorium measurements (colour dots) every 1 second at slow speeds (1-5 m spacing) and at low terrain clearance show significantly improved detail over more than 40 anomalous conventional targets, including new anomalies in some areas.

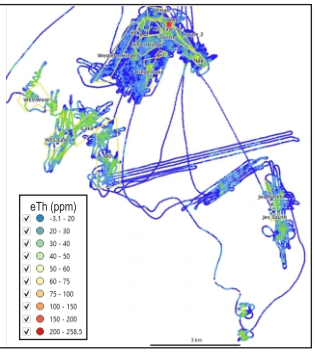
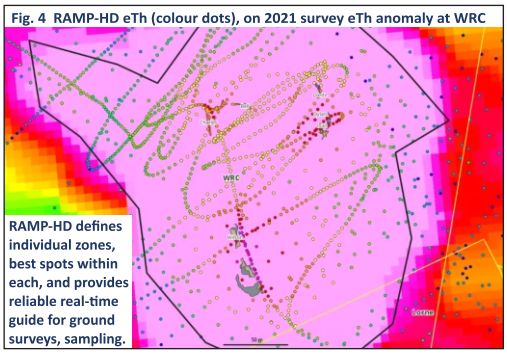


Fig. 4 RAMP-HD eTh (colour dots), on 2021 survey eTh anomaly at WRC



RAMP-HD defines individual zones, best spots within each, and provides reliable real-time guide for ground surveys, sampling.

Target

- Archean/Paleoproterozoic Beaverlodge Domain deformed, folded, metamorphosed late-to-post-orogenic schists, low to high grade REE-bearing pegmatites as lit-par-lit, dikes and sills (Fig 1).
- Rare earth elements in monazite, in lenses & meter-scale clusters
- High grades of total rare earth element oxides (TREOs) over significant widths, at and near-surface
- REE enriched with critical REE (Nd, Pr, Dy, Tb) in consistent ratios, up to 25% of total rare earth oxides
- Radioactivity (eTh) from REE-Th-rich monazite is exploration vector

Challenge

- 50 m spaced fixed wing gamma ray spectrometric survey flown 2021 (Fig 1) defined many eTh anomalies (Fig 2) over large areas. Difficult terrain, cliffs, steep topo: heli-supported ground-based surveying/prospecting is time-consuming and costly.

Solution - RAMP-HD

- In 11 hours RAMP-HD collected 38,000 measurements over >40 Appia-selected 2021 anomalies (Fig 3) guided by real-time results.
- RAMP-HD anomalies are greatly refined by very high sample density. Specific hot spots are accurately located within and between the conventional anomalies, providing precise focus for ground work.

WRC Area Detailed Comparison

- The 2021 survey used 50 m lines and produced a very broad eTh anomaly (Fig. 4) at WRC Area, that required repeated site visits over a few seasons to define.
- In minutes, the 2023 RAMP-HD survey covered the entire anomaly, detecting the best exposures of eTh (and related REE) with extremely high resolution data, spaced every few meters or less.

Other Detailed Comparisons

- Numerous examples illustrate RAMP-HD improved resolution, as indicated by arrowed poygons in the figures shown below (Fig. 5a-d).

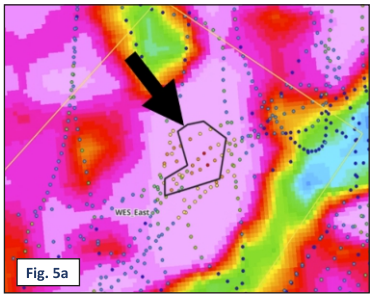


Fig. 5a

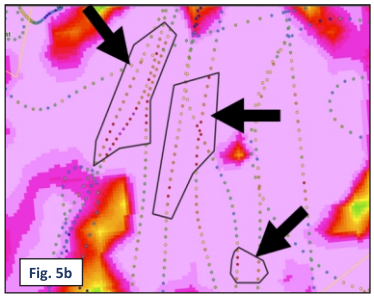


Fig. 5b

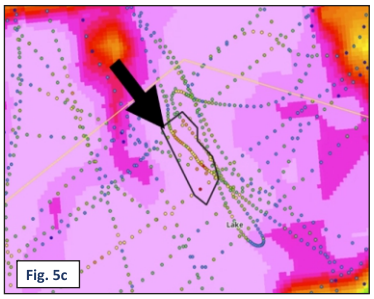


Fig. 5c

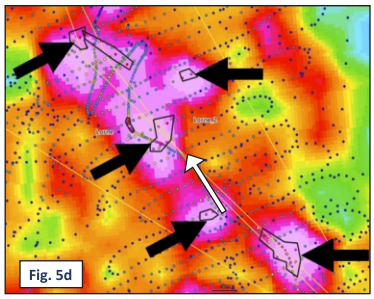


Fig. 5d

Bottom Line: RAMP-HD quickly reduced the 2021 anomaly footprints at Alces Lake to well-focused targets. Ground crews can walk directly to the best surface exposures to maximize surveying and sampling. Focus your follow-up, find your best targets sooner, dramatically reduce your time and cost to discovery!

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