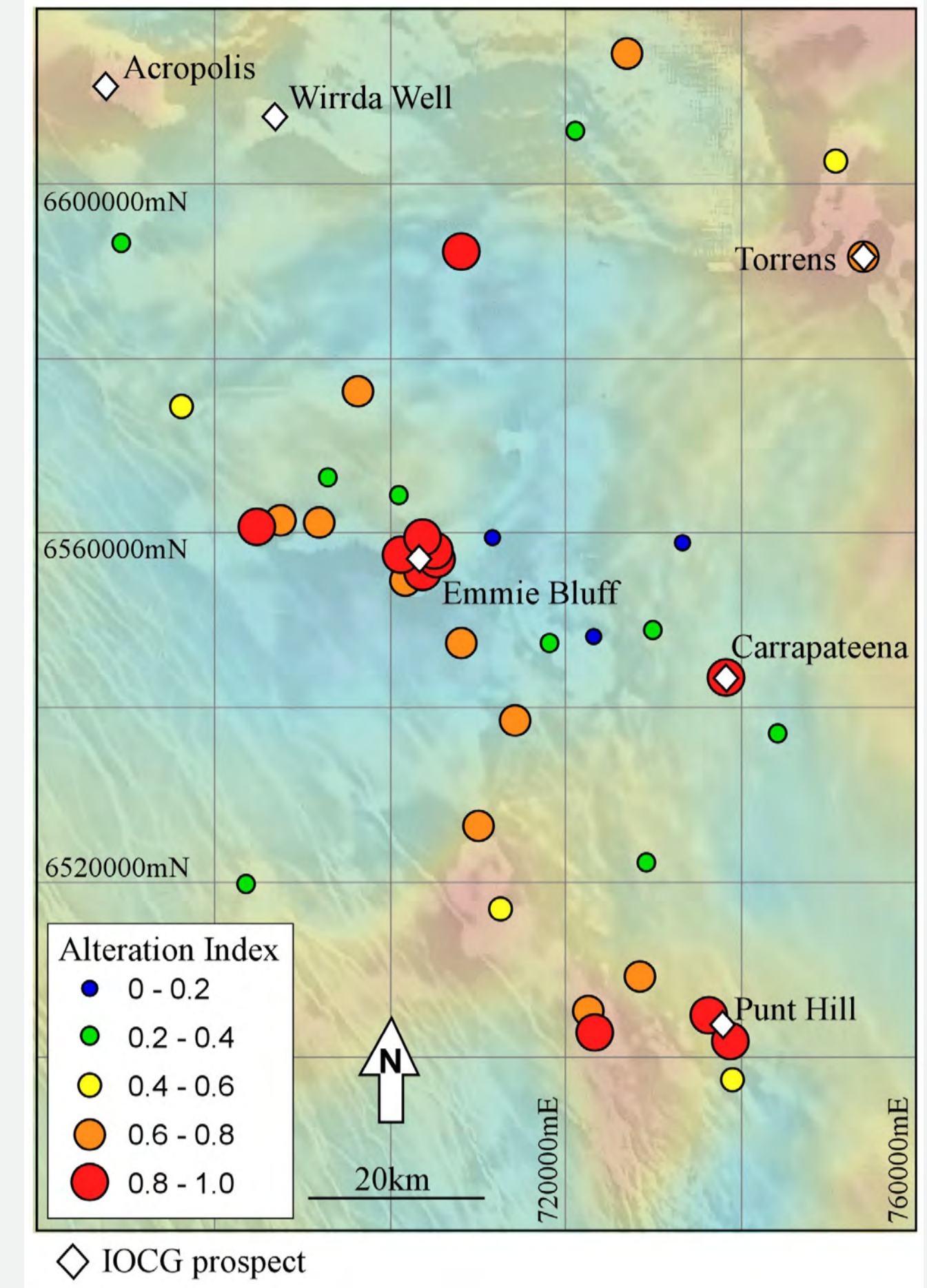


ABSTRACT

Ten pathfinder elements (Au, Ag, As, Bi, Cu, Mo, S, Sb, Se and W) have been identified to form geochemical halos around IOCG systems in the eastern Gawler Craton. In addition, rare earth element (REE) patterns in these systems are related to processes of mineral growth, lithology and mineralisation.

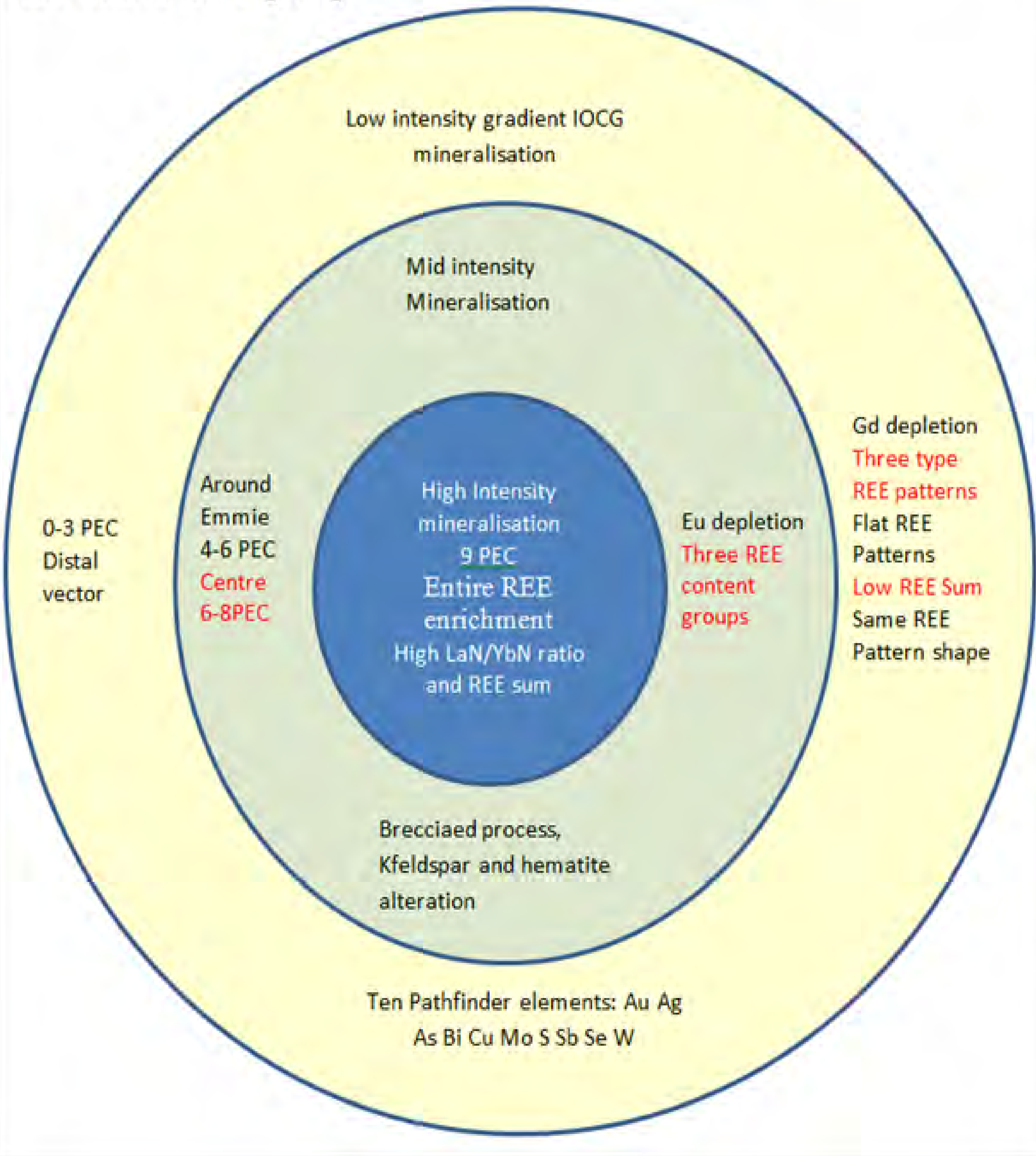
Distal to IOCG mineralisation, REE patterns are similar to PASS (Post-Archean Australian Average Sediment) and Gd is depleted. Closer to mineralisation, LREE content increases. Proximal to mineralisation, elevated Σ REE and LaN/YbN ratios are observed.



BACKGROUND

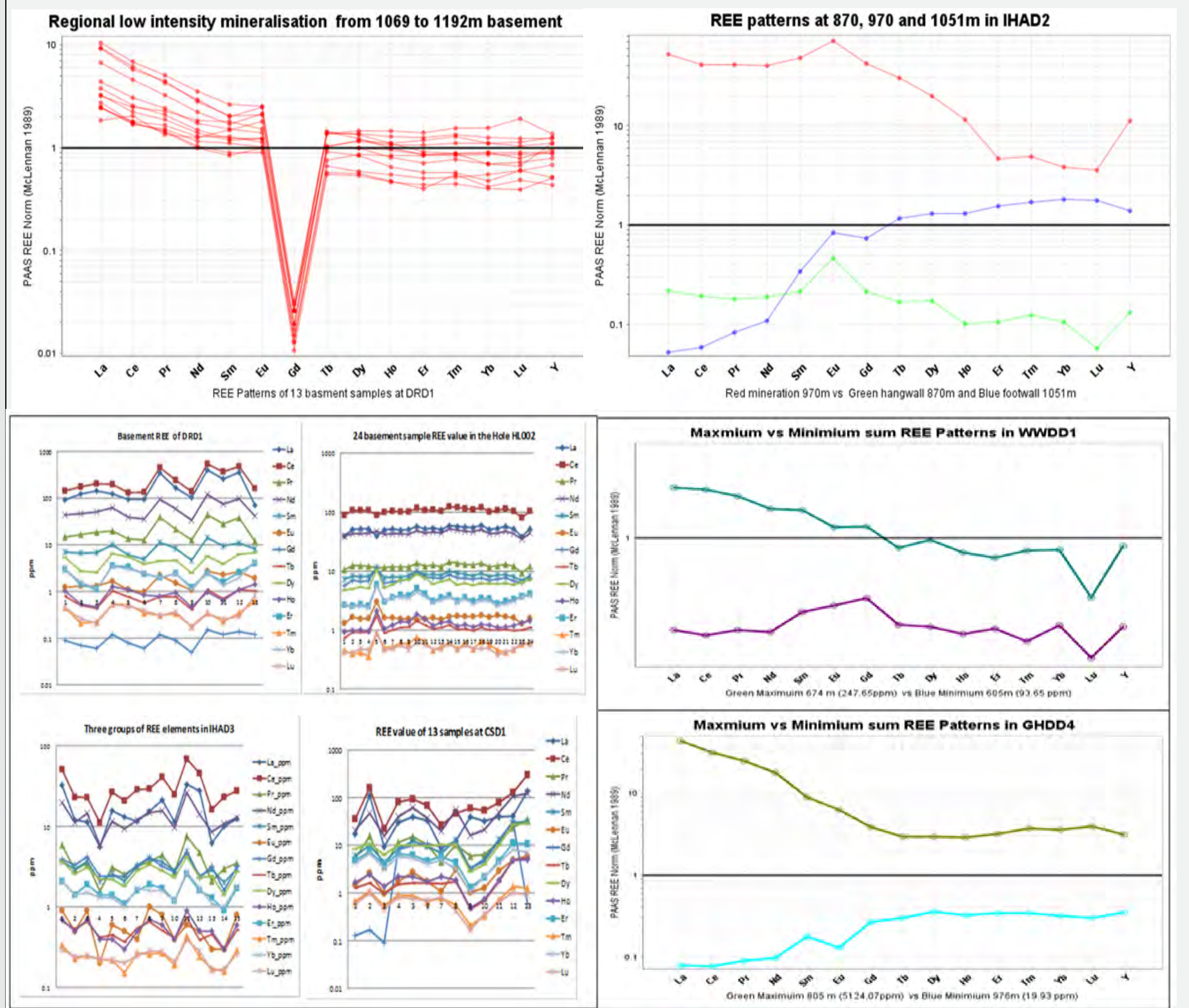
- 10 drill holes used
- Low gradient - Four holes have 0-3 PEC
- Emmie section - Four holes have 4-8 PEC
- High intensity zone - Two holes have 7-9 PEC
- PEC - the number of pathfinder elements > 10 times crustal abundance

REE Patterns for Targeting



REE Behaviours (Haas et al. 1995; Ban 1991; Michard 1989)

- REEs immobile: Below 350°C for fluid rock ratio 10^5
- REE limited movement: Fluid/rock ratio >math>10^2</math>->math>10^3</math> and >math>230^\circ\text{C}</math>
- pH<7 - ionic radius La/Lu>1; pH>7 ionic radius La/Lu<1, Eu³⁺ stable in fluid; With decreasing pH increase REE in fluids



CONCLUSIONS

Elevated LaN/YbN ratios and Σ REE is a proximal vector for IOCGs in the eastern Gawler Craton

