

# Abstracts (continue)

## 300 - A regional baseline of soil geochemistry in northwest Victoria: responsible development of critical minerals in the Murray Basin

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The Murray Basin in Victoria is a Palaeocene to recent intracratonic sag basin covering large portions of the state's northwest. The stratigraphy represents an initial fluvial system (Renmark Group) overlain by transgressive Murray Group sediments, then regressive beach-fluvial Wunghu Group rocks. Within the later, the Parilla Sand is a 10-20 m-thick, pebbly quartz sand representing a beach palaeoenvironment preserving distinctive fossilised beach dune landforms (strandlines). The Parilla Sand hosts significant mineral sand deposits of titanium-, zirconium- and REE-bearing minerals (e.g. zircon, monazite) within narrow strandlines and larger, more tabular (Wimmera) deposits. These minerals are classified critical in the Victorian Critical Minerals Roadmap and have been mined and rehabilitated in Victoria previously.

The Geological Survey of Victoria and the CSIRO are collaborating to better understand environmental baseline geochemistry, including the natural presence of critical minerals in northwest Victoria to support the Victorian Critical Minerals Roadmap. A geochemical soil baseline survey has been completed over 50,000 km<sup>2</sup> of northwest Victoria where heavy mineral sand deposits are known. Near surface soil samples from >100 sites represent the main soil, geology and environmental conditions found proximally to distally from deposits. The samples were dried, sieved and the sub-2 mm portion digested in a HF-based mixture. Multiple trace elements, including REE, were measured by a combination of ICP-MS and ICP-OES. One in five samples were part of a comprehensive QAQC program for the survey.

The data in a freely downloadable report show interpolated and point-source maps. The data vary regionally as influenced by soil, parent geology, environmental conditions and some anthropogenic input. This information forms part of an environmental geochemical baseline for the study area to support delivery of the Victorian Critical Minerals Roadmap. This work is part of ongoing baseline work in the study area on groundwater, vegetation, lake sediment and lake salt.