

SHALLOW GEOPHYSICAL AND HYROGEOLOGICAL STUDIES TO CHARACTERISE PALAEOCHANNEL PROPERTIES, A CASE STUDY FROM TANAMI DESERT, NT

John Joseph 1, 2, Dirk Kirste 3 and Lisa Worrall 1, 4*

- 1. Cooperative Research Centre for Landscape, Environment and Mineral Exploration*
- 2. School of Earth and Environmental Sciences, The University of Adelaide, Adelaide, SA 5005, Australia*
- 3. Department of Earth Sciences, Simon Fraser University, 8888 University Dr. Burnaby BC V5A 1S6, Canada*
- 4. Onshore Energy and Minerals Division, Geoscience Australia, GPO Box 378, Canberra ACT 2601, Australia*

Palaeochannels are typical geomorphic features representing drainage streams or rivers, which were flowing either during the past time and now stand buried or shifted due to tectonic or geomorphological processes. They often contain considerable thicknesses of sediment with elements which have been dated from the Mesozoic through to the late Cainozoic. These sediments are known to host, or act as pathfinders, to economic mineralization, and are an important source of potable groundwater, particularly in remote areas. Located about 600km northwest of Alice Springs, the Tanami region of the Northern Territory is an emerging gold province in Australia. Although not genetically related, some of the gold deposits are located on the margins of palaeochannels. Outcrop in these areas is sparse and bedrock is generally covered by *in situ* and transported regolith materials, that at places may reach more than 300m. Interest from industry and extensive drilling activity in the region has provided us with a natural laboratory to apply a multi-disciplinary approach for studying regolith properties and processes. As part of the research activities of Co-operative Research Centre for Landscape Environments and Mineral Exploration (CRC-LEME), we have carried out ground transient electromagnetic (TEM) and down-hole EM measurements as well as hydrogeochemical sampling of the open drill holes at the Titania mineral prospect. Apart from identifying possible locations of mineralisation, these studies have clearly delineated the structure of the palaeochannel, the character of the fill and the properties of the groundwater. A detailed discussion on the results will be presented.