Biogeochemical expression of the area NW of Area 223, Tunkillia, Gawler Craton, South Australia

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1. ABSTRACT

The Tunkillia Au-prospect in the Central Gawler Craton is an arid area consisting of extensive faulting covered by a longitudinal dunefield. The landscape is a difficult environment for most surficial exploration techniques, where possible mineralisation suggested by a large Au-in-calcrete anomaly is covered by excessive amounts of aeolian cover. The dunefield that dominates the Tunkillia area is extensively colonised by vegetation, with two species selected for sampling in this study based on past results. The area has a variety of regolith-landforms that overlay the mineralisation in the area. *Casuarina pauper* and *Eucalyptus concinna* were sampled over a variety of landscapes to help express Au mineralisation using Au analyses in conjunction with other element suites such as Mo, As, Ag and Ce. Bore hole data was tested as a medium to help constrain localised mineralisation and to test the viability of this method. This research has major implications for other areas of the Central Gawler Craton and similar landscapes, suggesting biogeochemical exploration is a useful sampling medium over different scales, providing sufficient orientation studies have been conducted to constrain the best species and organs for sampling in the area. This study helps to identify biogeochemical exploration as a powerful tool for mineral exploration undercover by plotting chemical values from samples over spatial regolith landform maps. This can assist in highlighting potential mineralisation in conjunction with other studies such as soil sampling, as well as helping suggest rock types of the underlying substrate. This study has found areas that could potentially host Au mineralisation, and also has had success in suggesting rock types of the underlying substrate in parts of the area.