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## ID-TIMS U-Pb Geochronology of the Tayatea Dyke Swarm of Australia: Identifying Tasmania's Nearest Neighbours in the Proterozoic

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The Tayatea Dyke Swarm (also known as the Tayatea Dolerite) comprises well-exposed northeast-trending tholeiitic dykes that intrude the Rocky Cape Group (RCG) of northwest Tasmania, Australia. The dykes commonly have sharp chilled margins, and are steep to sub-vertical. Previous K-Ar radio-isotopic analyses yielded ages of  $584 \pm 8$  Ma and  $600 \pm 8$  Ma (Adams et al., 1985). Both of these ages are significantly younger than the regional geology suggests, and an ongoing controversy exists regarding whether these represent true magmatic ages (Corbett et al., 2014).

An extensive detrital zircon study of the RCG (Halpin et al., 2014) has constrained its maximum depositional age and provenance. The RCG is largely shallow-marine siltstone and records sedimentation during rifting of a passive margin and hence is an important element in determining Tasmanian tectonic history in the Proterozoic. The detrital U-Pb zircon age distribution in the RCG is distinct from currently adjacent Mesoproterozoic basins on mainland Australia (Black et al., 2004, Halpin et al., 2014). Detrital ages indicate deposition between c. 1250 Ma and 1450 Ma. On this basis correlations have been made with the c.1.45-1.37 Ga Belt-Purcell Supergroup of North America and with the Transantarctic Mountains of East Antarctica (Mulder et al., 2015, Halpin et al., 2014). This association has led to recent paleogeographic reconstructions that propose the RCG was deposited as proto-Australia rifted from Laurentia (Halpin et al., 2014). This supports the hypothesis of an independently developing Tasmanian craton as opposed to a genetic association with mainland Australia. Geochronology of dolerite dykes from the Tayatea Dyke Swarm will provide absolute timing of rift-related magmatism and evaluate this hypothesis of an independently drifting Tasmania. Short-lived magmatic events associated with rifting such as the Tayatea Dyke Swarm may allow more precise and testable solutions for correlation with potentially adjacent

cratons (e.g., Bleeker and Ernst, 2016). Dyke swarms such as this are often emplaced on the order of a million years, making the Tayatea Dolerite a potentially useful geodynamic marker, one that may provide a precise piercing point with a conjugate margin during Tasmanian rifting in the Proterozoic.

Without accurate and precise geochronological constraints on the Tayatea Dolerite these proposed reconstructions are untestable. Using ID-TIMS U-Pb geochronology on baddeleyite and zircon from representative dykes of the Tayatea Dyke Swarm, we present new ages in order to constrain the depositional age of the Rocky Cape Group and provide new evidence for the identification of potentially adjacent cratons and subsequent drift history of Tasmania.

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