

R S Morrison Honours thesis

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THE GEOLOGY, PETROLOGY AND GEOCHEMISTRY

OF

SOUTHWEST SAINT FRANCIS ISLAND,

SOUTH AUSTRALIA.

THE UNIVERSITY OF ADELAIDE

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Abstract

The geology of Saint Francis Island, South Australia, consists of two separate crystalline basement complexes: the acid volcanic complex to the northwest and the slightly younger alkali granite complex to the south. The acid volcanic complex, composed of mainly tuffaceous rhyolite, is intruded by contemporaneous dacite dykes and later by a leucogranite plug. The alkali granite is host to a set of rhyolite dykes and one megacrystic dacite porphyry dyke. The crystalline basement complexes have been correlated to the middle Proterozoic Gawler Range volcano-plutonic complex of South Australia.

Magma parental to the acid volcanic suite developed by means of crystal fractionation of more basic material at lower continental crustal regions. Intrusion of hot lower crustal melt into shallow crustal levels caused partial eutectic melting and the development of an alkali granite pluton which intruded the acid volcanic pile.

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