

Lithostratigraphy and Lithochemistry of Ordovician volcano-plutonic rocks in the Blayney area, central Molong Belt, NSW

Peter B Duerden BSc.



University of Tasmania

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Abstract

The Late Ordovician Cabonne Group lies in the southern portion of the Molong Volcanic Belt in central western NSW. It broadly comprises an extensive lava-dominated package of high-K calc alkaline mafic volcanics (Blayney Volcanics) overlain by a package of shoshonitic lavas and intrusives (Forest Reefs Volcanics).

Regional aeromagnetic and structural data suggest that thrust style faulting may have caused the extensive lithological repetition observed within the Cabonne Group.

Volcanic facies mapping, combined with geochemical sampling, has provided a basis for re-interpretation of areas within the Cabonne Group. Facies mapping has demonstrated a number of possible stratigraphic correlations, including a possible link between limestones present at and surrounding Browns Creek with limestones within the Weemalla Formation at the base of the Forest Reefs Volcanics.

Geochemical and petrological data define a temporal change in magmatic affinities within the Ordovician volcanics of the Molong Volcanic Belt. This change in magmatism from high K in the Blayney Volcanics to shoshonitic in the Forest Reefs Volcanics is broadly coincident with the late Middle Ordovician limestone interval at the base of the Forest Reefs Volcanics.

This broad lithochemical stratigraphy provides a framework for comparisons with the Ordovician Junee-Narromine volcanic belt located 100 km to the west, where a similar temporal transition exists from high-K in the Nelungaloo Volcanics to shoshonitic in the overlying Goonumbla Volcanics.

The Ordovician volcanics from the Molong belt are also similar to the early to mid-Miocene calc-alkaline to shoshonitic suites from Fiji. On the basis of these similarities, the transition from high-K to shoshonitic volcanism is likely to be the result of fragmentation of a mature oceanic island arc as a result of a major tectonic disturbance as marked by the late Middle Ordovician limestones.

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