

**Linking Permian magmatic activity in the southern New England Orogen with ash-fall tuff horizons in the Bowen, Gunnedah and Sydney Basins**

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The late Permian Wandsworth Volcanic Group (WVG) in the southern New England Orogen (SNEO) is dominated by amalgamated rhyodacitic to felsic eruptives. Field relationships indicate a broadly contemporaneous (though not necessarily genetic) relationship with late Permian granite magmatism. Zircon SHRIMP studies show the youngest preserved member of the WVG (Dundee Rhyodacite) is  $254.1 \pm 2.2$  Ma while the dating of the currently exposed base of the WVG indicate ages typically around  $256.4 \pm 1.6$  Ma. A short period of substantial intermediate to acid eruptive volcanism is indicated. The compositionally unevolved Drake Volcanics to the north east are older ( $264.4 \pm 2.5$  Ma). Late Permian granites of the SNEO are dominantly 256–251 Ma (including many formally regarded as Triassic), with younger Triassic plutons (Mole, Stanthorpe, Ruby Creek, Dumboy Gragin) typically in the range 246–243 Ma. Granite magmatism youngs towards the east of the SNEO with episodic emplacement at ~240 Ma, ~230 Ma and ~220 Ma and 212 Ma, rather than a single, terminal flourish. Associated volcanism for much of this activity (except the last) has not been preserved. Of note in this study is the coincidence of mid to late Permian to Lower Triassic ages of granite magmatism and volcanism in the SNEO with ID-TIMS dating of zircons from the adjacent Sydney, Gunnedah and Bowen Basins, strongly suggesting the SNEO as the dominant source of volcanic material into these adjacent basins. The basins thus probably retain a detailed record of magmatic activity in the adjacent orogen.