

**SMEDG**

SYDNEY MINERAL EXPLORATION DISCUSSION GROUP



## SMEDG - Exploration NSW Update on the Cargelligo, Goulburn and Lachlan Orogen Projects

Thursday, 19th June 2003, from 4:30 to 7pm at  
North Sydney Anzac Memorial Club  
Cnr Ernest & Miller Streets Cammeray

### Geological Survey of New South Wales

*presents recent mapping and research for :*

#### **Cargelligo Region**

**Outcomes of Second Edition mapping with implications for base metal mineralisation**

*Gary Colquhoun*

In the Cargelligo region, detailed geological mapping, petrology, palaeontology and SHRIMP U/Pb dating has had several important outcomes. The felsic Siluro-Devonian Ural Volcanics are better defined in terms of volcanic facies, environment of deposition, age and associated mineralisation styles. This unit consists of submarine felsic lavas, lava domes, turbidites and resedimented pyroclastic debris sourced from isolated subaerial volcanic vents. Detailed structural mapping of the extensive Ordovician turbidite sequence has identified complex faulting, some controlling gold mineralisation, and has better defined internal stratigraphy. Together with over 50 newly discovered graptolite and conodont localities, this work has enabled correlation with sequences in Victoria and eastern NSW. Silurian granite plutons, some of which host historic tin mines, are better described and geochemically characterised. Detailed regolith mapping, has identified large areas of previously-unrecognised shallow subcrop.

#### **Goulburn Region**

**Mapping highlights & 3D visualisation of geology using geophysical modelling**

*Owen Thomas*

Highlights of the mapping include the recognition of the complex volcanic and clastic stratigraphy of the mid-late Silurian sequences; recognition that the Hill End Trough and Ngunawal Basin (Captains Flat area) are both part of a continuous marine basin and expands the area prospective for VHMS Cu Pb Zn Ag Ba Au deposits along the Frogmore Fault Zone in the west, and the Yarralaw Fault Zone in the east; delineation of a number of major structural domains characterised by marked variations in strain and structural style and these domains correspond with the late Silurian-Early Devonian depositional basin and its adjoining shelves - the Early Silurian Benambran tectonic event was strongly imbricate in structural style while the Mid Devonian Tabberaberan tectonic event involved large scale folding with thrusting reflecting reactivation of Benambran basement structures; and the use of geophysical modelling has contributed to a more confident interpretation of the third dimension. For instance, 3D modelling has identified possible structural fragments of the Macquarie Arc which are inferred to be imbricated within the Ordovician turbidites south along the Frogmore Fault Zone and this arc material may provide a local source for structurally controlled Cu Au deposits.

#### **Hill End Trough**

**New structural insights into gold mineralisation**

*Jeff Vassallo*

Our studies indicate that two major deformation events ( $D_1$  and  $D_2$ ) have created structural pathways and traps for gold-bearing fluids in the Hill End Trough.  $D_1$  is a previously unrecognised event that formed a regional cleavage at biotite grade. Structural and stratigraphic relationships suggest that  $S_1$  formed during NE over SW ramp-flat style thrusting. In this model the Hill End Trough is allochthonous lying above a regional  $D_1$  floor thrust that roots to the NE of the trough in Ordovician volcanic rocks. In the SW part of the Hill End Trough a splay off this floor thrust ramps up through the Cunningham Formation providing a direct path for fluids to traverse high up in to the metasedimentary pile. The previously recognised main regional deformation,  $D_2$  formed N-S trending folds, cleavage and faults. Basement reactivation of younger over older thrusts occurred, especially in the E part of the Hill End Trough. Gold was localised in a variety of  $D_2$  structural traps including bedding parallel veins, saddle reefs and reactivated thrusts.

#### **The Lachlan Orogen Synthesis**

**Overview**

*Dick Glen*

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*Refreshments will be served*

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