

Exploration for sedimentary-hosted carbonate base metal mineralisation at Manuka, Winduck Shelf, Darling/Cobar Basin, NSW Australia.

Lally, J¹, Lindsay, N², Prendergast, K³, Vigar, A⁴

1 Principal Resource Geologist, Mining Associates, Spring Hill, Q, 4001 james@minasc.com

2 Consultant, Manuka Resources, Sydney, NSW nlindsay@manukaresources.com.au

3 Principal Geologist, Mining Associates, Spring Hill, Q, 4001 kylie@minasc.com

4 Principal Geologist, Mining Associates, Spring Hill, Q, 4001 andrew@minasc.com

EXPLORATION FOR SEDIMENTARY-HOSTED CARBONATE BASE METAL MINERALISATION AT MANUKA, WINDUCK SHELF, DARLING/COBAR BASIN, NSW AUSTRALIA.

The Manuka Ag-Pb-Zn deposit (formerly Wonawinta) located in central NSW is hosted by weakly deformed platform carbonates deposited on the margin of an intracratonic half-graben between the Cobar and Darling basins. The platform developed during the Early Devonian on a basement high marking the western extent of the Cobar basin and subsequently overlain by Darling Basin sediments. Manuka has been previously linked to formation of base metal deposits during Cobar basin inversion at the end of the lower Devonian.

Using geological compilations and 2D seismic data produced by Geoscience Australia and NSW Geological Survey we conclude that host stratigraphy and major structures at Manuka are westerly dipping into the Darling Basin, a potential source of fluids and metals. The Darling Basin contains over 8000 m of Late Silurian to Early Carboniferous (predominantly Devonian red-beds) sediments contained in a number of distinct structural depressions and include potential petroleum source rocks. The basin was last deformed during the Early Carboniferous Kanimblan Orogeny.

Manuka is hosted in silicified and dolomitised Booth Limestone Member as lenses of Pb-Zn-Ag sulphide in close association with pyritic shale. The oxide resource of 52 Moz Ag is distributed over 6 km strike and sparse drilling beneath saprolite reports intersections of primary sulphides. Mineralogical studies show mineralisation is early pyrite-marcasite (overprinting framboidal pyrite) with sphalerite, galena, silver, barite and dolomite. Silver is late-stage and locally high levels of mercury at Manuka is intriguing and likely represents a separate mineralisation event.

Stratigraphy, mineralogy, geochemistry and local and district structural setting at Manuka is consistent with an MVT-Irish Style system connected to the Darling Basin and hence part of a large and relatively unexplored MVT-Irish style district. Exploration is focused on identification of the structural setting including previously unrecognised NE to ENE striking transverse faults. Integration of geochemistry with a developing structural-stratigraphic model and substantial geophysical (magnetics, gravity, VTEM) datasets is the basis for targeting.