



CALCRETE GEOCHEMISTRY IN THE COBAR-GIRILAMBONE REGION, NEW SOUTH WALES

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CRC LEME OPEN FILE REPORT 200

January 2006

Abstract

Calcrete is widespread in the regolith of the Cobar-Girilambone region, most commonly occurring as nodules in the lower part of the soil profile or as laminated masses and coatings on underlying saprock/bedrock. A wide-spaced, reconnaissance sampling program has established the nature and geochemical composition of this calcrete and indicated its potential as a geochemical sampling medium for mineral exploration in the region. The calcrete includes calcite- and dolomite-rich varieties, but with some (possibly mixtures) lying between these compositions and a few containing magnesite. Nodular and near surface calcrete tends to be calcite-rich, whereas hardpan and coating calcretes on bedrock are more commonly dolomitic. Strontium and Ba are concentrated with the calcrete. In the Cobar-Girilambone region, as in most parts of southern Australia, there is an association of dispersed gold with calcrete and calcrete generally has anomalous gold concentrations in areas close to, or down drainage from, known gold mineralisation. Results of this study suggest a regional threshold of 4 ppb Au and a local (deposit) threshold of 12 ppb. Calcrete samples with anomalous levels of Au were detected at a number of sites with no known gold mineralisation. Some other elements were also found to be concentrated in calcrete in areas where these have been dispersed from known sources. These elements include Ag, Cu and Bi (e.g. in the Cobar Gold Field and at the McKinnons gold deposit) and Ni and Co (in areas of weathered ultramafic rocks). Calcrete deposits with anomalous Au contents occur in transported regolith down drainage or palaeodrainage of major gold mineralisation (e.g. southwest of the Cobar Gold Field). The scale of this dispersion and accumulation in calcrete suggests that calcrete sampling could be used for regional reconnaissance exploration (similar to regional stream sediment sampling) as well as for local detection of mineralisation in areas of in situ regolith. Much of the mineralisation in the Cobar-Girilambone region is polymetallic, containing base metals with associated Au. Analysing Au in calcrete could provide a useful pathfinder strategy in base metal exploration as well as a technique for locating gold deposits.