

## **HYDROTHERMAL ORIGIN FOR THE 2 BILLION YEAR OLD MOUNT TOM PRICE GIANT IRON ORE DEPOSIT, HAMERSLEY PROVINCE, WESTERN AUSTRALIA**

BARLEY, M.E. The University of Western Australia, Nedlands, Australia, 6907.

Giant iron-ore deposits, such as those in the Hamersley Province of northwestern Australia, may contain more than a billion tonnes of almost pure iron oxides and are the world's major source of iron. It is generally accepted that these deposits result from supergene oxidation of host banded iron formation (BIF), accompanied by leaching of silicate and carbonate minerals. New textural evidence however, shows that formation of iron ore at one of those deposits, Mount Tom Price, involved initial high temperature crystallisation of magnetite-siderite-iron silicate assemblages. This was followed by development of hematite- and ferroan dolomite-bearing assemblages with subsequent oxidation of magnetite, leaching of carbonates and silicates and crystallisation of further hematite. Preliminary fluid inclusion studies indicate both low and high salinity aqueous fluids as well as complex salt-rich inclusions with the range of fluid types most likely reflecting interaction of hydrothermal brines with descending meteoric fluids. Initial hematite crystallisation occurred at about 250°C and high fluid pressures and continued as temperatures decreased. Although the largely hydrothermal origin for mineralisation at Mount Tom Price is in conflict with previously proposed supergene models, it remains consistent with interpretations that the biosphere contained significant oxygen at the time of mineralisation.