

STRUCTURAL, METAMORPHIC AND GEOCHEMICAL DISTINCTIONS  
OF LOW AND HIGH GRADE TERRAINS, FOX MOUNTAIN AREA, NORTH WEST QUEENSLAND

by

PETER W. NASH, B.Sc.

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## ABSTRACT

The study area, located in the eastern succession of the Mt. Isa Inlier, consists of interbedded metamorphosed calcareous, pelitic, quartzose and chert sediments of the Mary Kathleen Group.

Two zones with contrasting structural styles and metamorphic grades are present within the study area. An eastern succession of openly crossfolded metasediments and a western tight to isoclinally folded succession intruded by granites of different ages.

Metamorphic grade varies between the two areas. Zone 1, to the east contains mineral assemblages typical of the upper Greenschist Facies while to the west in zone 2, the assemblages typify the Almandine Amphibolite Facies. Garnet-biotite and garnet-hornblende geothermometers indicate temperatures of 430-480°C in zone 1 and temperatures of 600-650°C in zone 2.

Comparison of the two zones, which have been faulted against one another after regional metamorphism, has helped elucidate changes in mineral chemistry and geochemistry with increasing metamorphic grade.

The geochemistry of the two major units; the older Overhang Jaspilite in zone 1 and the overlying Corella Formation in zone 2, show similarities in major element compositions, particularly Al, Ti and Fe, which are related to the source of sediments. Mg, Na and Ca content is generally higher in the Corella Formation and is related to a more evaporitic environment of deposition.

A comparison of dolerites that pervade the study area have been used for the study of changes in mineral chemistry with metamorphic grade, and show changes from tremolite-biotite-albite-epidote assemblages in zone 1 to hornblende-oligoclase/andesine ± garnet assemblages in zone 2.

Garnet-biotite schists of similar bulk rock compositions are found within both zones and show trends from low Ti, high Mg/Mg + Fe in biotite and high CaO + MnO in garnets to high Ti, low Mg/Mg + Fe in biotite and high Fe + Mg in garnets with increasing grade.