

Chapter 7

Metamorphism and Alteration

Metamorphism is generally defined as a structural/textural modification and/or mineralogical modification of a pre-existing rock involving crystallisation of new phases, recrystallisation of existing phases, and/or strain.

Thermal Metamorphism

Metamorphic rocks in the district include thermally metamorphosed sedimentary and volcanic rocks close to igneous contacts and incipiently metamorphosed rocks in zones of hydrothermal alteration. Examples of thermal metamorphism include: graphitic siltstones and metasandstones of the Lok Ma Chau Formation, marble of the Yuen Long Formation, and metamudstone, metasandstone, marble, skarn, calcsilicate rock and quartzite of the Tolo Harbour Formation. These metasedimentary rocks are mostly encountered in boreholes in the vicinity of The Brothers islands and at the Tung Chung reclamation. The rocks have been metamorphosed by the intrusion of granite.

A narrow (100 m wide) zone of contact metamorphism within the Lantau Volcanic Group is present along the caldera boundary in the western part of the district between Tung Chung valley and Sha Lo Wan. In this area, the intrusion of quartz monzonite along the caldera boundary has not only metamorphosed the adjacent volcanic rocks, but also has given rise to local pockets of mineralization.

Hydrothermal Metamorphism

Hydrothermal metamorphism (or alteration), involving the addition of hot water and crystallisation of new minerals, has locally affected volcanic and granitic rocks close to fault zones. In granites, this process is characterised by chloritization of biotite and hornblende, and sericitization and clay mineral alteration of feldspars. A broad zone of hydrothermal alteration is present within the Lantau Volcanic Group in the northeastern part of the district. The rocks are typically altered to a reddish grey colour, which weathers to pinkish white.