

ANVIL DISTRICT METAMORPHISM

The Anvil District is a polymetamorphic terrane with two major metamorphic episodes which are concurrent with two periods of intense mid-Mesozoic fold deformation. The second metamorphism has largely overprinted the early metamorphic mineral assemblages. Further discussion will consider only this later metamorphism.

Metamorphic grade ranges from upper amphibolite facies (sillimanite-muscovite zone) to lower greenschist facies (muscovite-chlorite zone) in a low pressure Buchan type facies series. Metamorphic isograds are roughly concentric about the Anvil batholith.

Index metamorphic minerals in the Mount Mye pelites include muscovite, chlorite, chloritoid, biotite, garnet, andalusite, and staurolite. Fibrolite and cordierite occur locally immediately adjacent to the Anvil batholith.

In the greenschist facies the Vangorda formation consists of silvery grey, slightly calcareous muscovite-chlorite phyllite. In the amphibolite facies the phyllites are transformed to a discontinuously banded, dark brown and pale green, slightly calcareous, calc-silicate unit. This metamorphic transition is extremely striking, and for many years in the District the low grade phyllites and the high grade calc-silicates were not correlated stratigraphically. Deep exploration drill holes since then have intersected examples of the transition sequence.

The Faro deposit is metamorphosed to amphibolite facies. All other deposits are only weakly metamorphosed to lower greenschist facies. This difference in metamorphism is reflected in decreased grain size and increased degree of mineral intergrowth in the less metamorphosed deposits. The metamorphic overprint also appears to influence the chemistry of the deposits. The greenschist facies deposits have gold contents eight times greater than the Faro deposit. They also have slightly higher silver, mercury, and arsenic contents than the Faro ores.