

THE GEOLOGY OF AUSTRALIAN OPAL DEPOSITS.

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Australian opal is hosted predominantly by sedimentary rocks of the Cretaceous, Great Artesian Basin (GAB). Silica, derived from weathering forms spheres which are deposited in a regular array. Once a certain size is reached precious opal begins to form.

Host rocks contained a variety of voids formed by the weathering process; leaching of carbonate from boulders, nodules, fossils, along with existing cracks, hollow centres of ironstone nodules and horizontal seams. Most opaline silica deposited is *common opal* (or *potch*). It does not show a play of colour. Opal also fills pore space in sand size sediments cementing the grains together forming deposits known as matrix or opalised sandstone.

Opal is often associated with lineaments or faults which break up the rock providing waterways for the movement of ground water. These have been found useful in locating opal at Lightning Ridge in New South Wales (NSW) and pursued in other states.

In addition, opal has been found associated with ancient palaeochannels in Queensland, and Lightning Ridge (NSW) often adjacent to these channels, which provide water channels.

Variations in the types of opal depend on a number of factors. Firstly the climate provides alternating wet and dry periods creating a rising or importantly, a falling water table which concentrates silica in solution. The silica itself is formed by deep weathering of Cretaceous clay sediments producing both silica and kaolin. Silica spheres are deposited in a regular array in voids from a receding water table forming precious opal in a variety of host materials.