



## Craters and Limestone Precinct:

### Mount Gambier's Blue Lake and Crater Lakes Complex



The Blue Lake is the most well-known of the three maar craters within the Crater Lakes complex which were formed 30,000 years ago, and is world famous due to its colour change from winter's steel blue to brilliant turquoise blue each November.

The lake is a little over 70 metres at its deepest point, and about 45 metres deep at the edges, it is estimated to contain 36,000 million litres of water. A relatively small portion of that is pumped annually, about 3,700 million litres, into holding tanks which gravity feeds water to the city and surrounds.

#### Why is the Blue Lake blue?

A range of explanations have been proposed over the last century. It was suggested that the blue colour was caused by fluorescence of dissolved organic matter which builds up seasonally in the upper layers of the lake. Another theory was that the blue colour was caused by absorption of all incident visible radiation except blue by finely crystalline calcite in the surface of the lake.

However, the natural colour of water is blue, and for the same reasons that the sky is blue. Therefore, the Blue Lake (and all lakes) should be blue. The question to answer is: Why does the Blue Lake become less blue in winter?

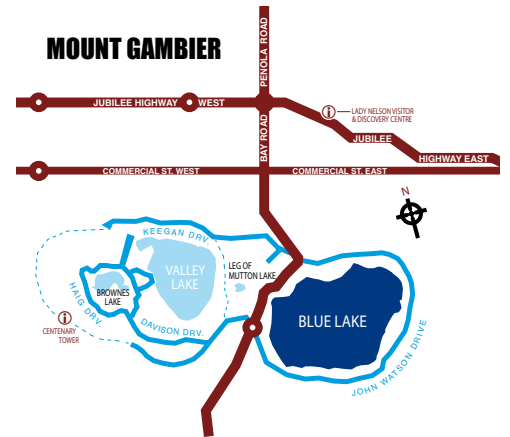
#### Why does the Blue Lake change colour?

The colour change is due to the removal of humic substances (e.g. tannins) from the upper part of the lake by calcite precipitation. The humic substances are yellow in colour, because they absorb blue light. The humic substances come from dead algae and land vegetation.

The first 20 metres of the lake warms from spring onwards and creates an isotherm (temperature barrier between two bodies of water). With two bodies of water, of different temperatures, little or no mixing of the water occurs.

When the lake water warms during summer the calcite precipitates. The lake water flows into the lake through the limestone rocks, and the water contains lots of dissolved limestone. When the lake water warms up in the summer, and the limestone precipitates out of the water. As it happens, the humic substances are chemically attracted to the calcite crystals and co-precipitate with calcite. The calcite, with humic substances attached, falls to the floor of the lake.

So during summer, the surface waters have the humic substances removed and hence the natural blue colour of the water is more evident.



#### Things to do:

- At the outstanding Blue Lake Reception Centre, located on the edge of the lake, there is access to a comprehensive interpretation of the volcanic area
- The Blue Lake Tour includes a ride in a glass-panelled lift down the original dolomite well shaft for a closer view. You will also learn about the hydrology of Mount Gambier's water supply and the aquifer system, and hear interesting stories about local history, European settlement, folklore and aboriginal legend.
- The 3.6km road and walking track around the circumference of the Lake provides some excellent volcanic layering profiles as well as access to many viewing points, the most popular being the underpass between the Blue Lake and the Leg of Mutton Lake.
- Adjacent to the Blue Lake is a public 18-hole golf link, caravan park and the entrance to the Valley Lake crater.
- View the Adam Lindsay Gordon Monument which was erected in 1887, at the scene where the Australian Poet leapt upon his horse, the Red Lancer, over a guard fence onto a narrow ledge on the side of the Blue Lake above a 70 metre sheer drop to the Blue Lake. To this day the amazing feat has never been repeated.

For further information, a Crater Lakes Walks booklet is available at "The Lady Nelson Visitor & Discovery Centre" in Mount Gambier.



