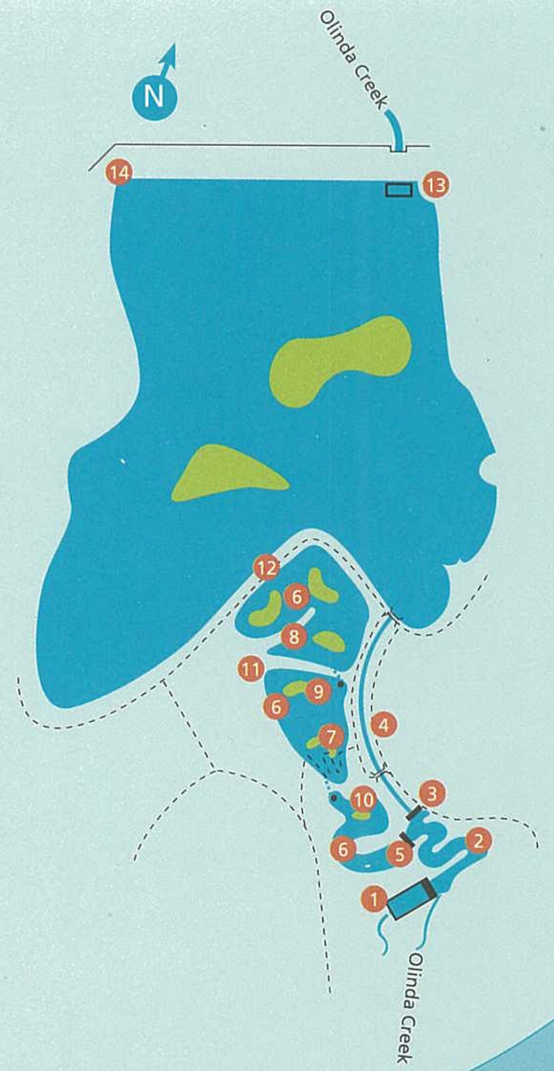

KEY

Plantation/Conservation zone
Water
Park trails

LILLYDALE LAKE

Contact

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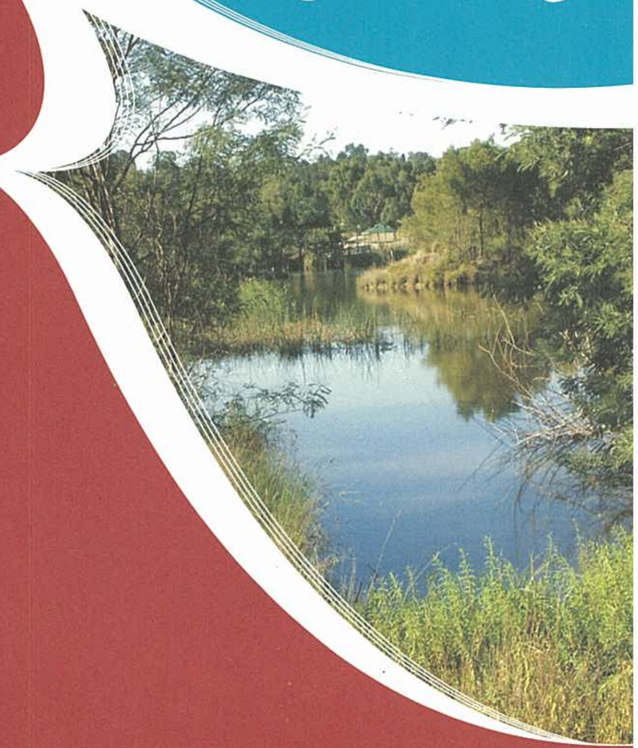
Environmental Engineering



LILLYDALE LAKE

Environmental Engineering

Lillydale Lake was constructed primarily to protect the Lilydale township from flooding. The primary function of the lake wetlands is to improve water quality and help control weed growth by removing silt containing high levels of nutrients.

"Soft Engineering" was chosen as the means of operating the wetland system. The advantages are low maintenance, principally self managing, environmentally friendly and minimal impact on the aesthetics of the park.

The first stage of the process is designed to slow water flow allowing silt to settle.

The primary sedimentation pond 1 can hold up to 300 cubic metres of silt and has been constructed to allow vehicle access for removal of accumulated silt. It is estimated 22% of suspended silts are retained in the primary sedimentation pond and 18% in secondary ponds.

A perforated brick wall between the primary and secondary ponds maintains a steady, uniform flow. Both of these ponds and the first section of the wetland 2 can be drained for maintenance by opening a gate valve in the weir across the old creek 3. This makes desilting a simple process. This weir has a 150mm diameter pipe at its base to ensure creek flow is constantly maintained and prevents the old creek bed 4 from becoming stagnant. A broad spillway carries large amounts of water at high flow times.

The weir 5 into the wetland 6 also has a pipe set at low level to ensure flow is maintained. In reverse, it also allows water to drain back from the first wetland pond into the creek. A sluice at the top of this weir allows for multiple adjustment of flow into wetlands.

Consisting of three separate sections, the wetlands is designed to allow slowing of the flow and further sediment settling.

A series of islands 7 and baffles 8 direct water through the longest possible route while maintaining a steady, uniform flow.

In wetland one and two, the depth varies from 3 metres to 500mm to assist in mixing water from bottom to top therefore aerating the water.

Water moves between the wetland areas in two ways, the most obvious being two large pits 9 leading into 600mm diameter pipes that travel beneath the dividing walls. There are also smaller pipes 10 500 mm diameter below these to carry water at low flow times.

The second and less obvious is a layer of scoria beneath the dividing walls of section two and three 11 forming a rock filter.

This layer of scoria is 300 millimetres thick, 10 metres wide and about 100 metres long. As water passes through, silt is trapped and accumulates until lumps fall off and settle at the downstream end of the filter. This filter was experimental and its long term viability is yet to be proven.

Water finally enters the lake through large pipes under the wetland wall 12 .

Islands in the lake act as baffles to spread water flow and discourage the natural tendency of water to travel direct from entry to exit.

Water leaves the lake through the main overflow tunnel 13 and returns to Olinda Creek.

The western end of the dam wall is constructed in such a fashion that in the event of a severe flood it will "give way" allowing excess water to escape. This section, called the "fuse" 14 ensures the remaining wall remains intact.