



Royal Melbourne Golf Club - over 8 years of stormwater harvesting and treatment experience

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OVERVIEW:

Since winning the Stormwater Victoria Award for Excellence in Infrastructure in 2010, the Stormwater project at Royal Melbourne Golf Club (RMGC) has harvested and used in excess of 350ML of stormwater that would have otherwise been discharged to Port Phillip Bay. This paper provides the background to the project and details our experience in operating and maintaining the water treatment infrastructure. In its first 8 years of operation, the plant has demonstrated its reliability and effectiveness in providing a reliable treated water source and is unique for several reasons, including its high water recovery and combination of different technologies. The operation of the plant has provided insight into a number of key design and operation improvements which can be carried through into future stormwater treatment plants, such as managing the quality of the treated water to be better suited for the end application; the management of algae and biological fouling aspects, especially in summer; as well as the optimisation of the membrane process operation. Through a combination of research, investigation and process optimisation the different operational and design improvements have been identified and implemented across the life of the plant to date, and in most cases immediate improvements observed. The details of the problem, the actions followed to identify the cause, the method to reach the required solution, the process or operational modifications made as well as the observed results and improvements will be presented in the paper.

OBJECTIVES:

The Water treatment plant includes a combination of membrane technology and natural technologies to fulfil the project objectives, achieving >99% water recovery. The water treatment infrastructure was successfully commissioned in January 2010 and provides a reduction in potable water consumption of up to 120 ML/year, treating a combination of groundwater and stormwater. The treatment approach ensures a reduction in solids, nutrients, oil and greases as well as disinfection to enable unrestricted irrigation. There is also side-stream treatment to manage the salt load. The design along with the operational experience of the plant provides an industry template for stormwater treatment.

METHOD:

The primary processes involved are Bioretention filtration, Membrane filtration, Reverse Osmosis, Chlorine Contact Tank and Surface Wetland. On-line process monitoring of key process parameters with a focus on continual improvement and optimisation allows early detection of performance deviations and trouble-shooting, while ensuring the operational performance is maximised. A combination of approaches including process optimisation through plant design improvements, regular on-site jar testing to better understand process

performance, a more theoretical evaluation through membrane autopsy and cleaning studies as well as focussed routine maintenance and operation has ensured continued reliability of the plant.

RESULTS:

In over 8 years of operation the plant has exceeded the project objectives, especially in terms of reduction in potable water consumption, increased security of supply, maximising water recovery and optimising reuse of existing infrastructure. If anything, the reliability and increased security of water has allowed the club to implement additional activities to improve the quality of the course. The successful operation and optimisation of the process has ensured the health targets for unrestricted irrigation have been constantly met, while through managed soil sampling there have been no unmanageable impacts on the quality of the playing surfaces.

CONCLUSIONS:

The plant has been operating for over 8 years and has operated successfully, exceeding the treated water quality expectations while ensuring all available water is treated and available for irrigation. The attention to detail, both in design and on-going process monitoring and optimisation has ensured the project has and will continue to deliver a water source to RMGC that achieves the projects objectives, both in terms of quality and quantity. The performance and sharing of results provides a good basis into the future as a template for future stormwater treatment facilities, providing design, operation and maintenance experience for stormwater harvesting.