

## THE GROVES, PLENTY VALLEY



1,500 lot residential subdivision on a greenfield site, incorporating a wide mix of housing styles, upgrades to major perimeter roads, investigations of Water Sensitive Urban Design opportunities and major trunk infrastructure extensions. The impacts of the proposed development on stormwater runoff quality and quantity were analysed using the latest computer software and methods developed at the University of Newcastle and the Cooperative Research Centre for Catchment Hydrology. The PURRS water balance model, WUFS rainfall runoff design model and the MUSIC water quality model were used to analyse the performance a various water sensitive urban design (WSUD) and integrated water cycle management (IWCM) scenarios. Local climate and demographic data was also used in the analysis.

Location:  
Whittlesea, Victoria

Client:  
Elderslie Property Investments /  
Clough Land Development

Contractor:  
Winslow Constructions

Construction Cost:  
\$5 million Stage 1  
\$40 million ultimately

It was established that the use of traditional drainage methods in the proposed development will result in significant increases in peak stormwater discharges, annual stormwater runoff volumes and annual pollutant loads. This would result in decreases in receiving water quality and increased flood risks in the down stream environment.

A full WSUD solution that includes rainwater tanks, bio-retention swales, small sediment basins, rain gardens and contour banks has been calculated to reduce peak stormwater discharges by 67% to 89%, annual stormwater runoff volumes by 77.7%, annual loads of TSS by 97.9%, annual loads of TP by 90% and annual loads of TN by 81.5%. In addition, the combination of water efficient appliances (3A shower roses, 6/3 flush toilets and tap regulators) and 3 kL rainwater tanks used to supply toilet and outdoor uses has been calculated to decrease annual mains water demand by 10.9 ML, peak day water demands by 20% and instantaneous water demands by 52%.

The use of rainwater tanks and water efficient appliances will reduce impacts on regional water security whilst decreasing the requirement for water pumps stations, water storage reservoirs, water mains and down stream stormwater management infrastructure. The requirement for downstream stormwater management infrastructure.

The WSUD solution will produce stormwater quality that is significantly in excess of the 'design standard' requirement for 80%, 45% and 45% reduction in suspended solids, phosphorus and nitrogen respectively. This will have the impact of reducing the impacts on stormwater quality and flow regimes on downstream catchments. In addition the full WSUD solution will comply with standard minor/major stormwater design safety requirements.

