

The Importance of Determining Pollutant Loads From Varying Rainfall Events for Stormwater Harvesting and Reuse Schemes

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Harvested stormwater is becoming an important alternate source of water supply for irrigation and other non-potable water uses. University of Technology Sydney and Blacktown City Council have been working together to monitor the stormwater quality in Angus Creek, a predominantly urban creek, to determine suitability of the water for use for stormwater harvesting applications, in particular irrigation, and to determine the level of treatment required to ensure the water was fit for purpose. This monitoring program used an auto-sampler to collect 8 samples per rainfall event of varying magnitude and duration with UTS analysing the samples.

From this research it showed that the concentration of the pollutants varied widely depending on rainfall intensity and duration as well as with the duration of dry period prior to the rainfall. Some correlations could be observed between water quality parameters. It was found that total dissolved solids (TDS) and conductivity as well as TSS and turbidity were highly correlated. There was also a correlation between rainfall and turbidity and between rainfall and TSS. If confirmed, certain parameters such as TSS, turbidity, DOC and total dissolved nitrogen (TDN) could be predicted based on the amount and intensity of rainfall. TDS and conductivity were high during base flow conditions or at the start of the rainfall but then dropped away as rainfall and time increased.

For all stormwater harvesting and reuse schemes it is essential to have a comprehensive understanding of the characterisation of water quality from the source during rainfall events of varying duration and intensity. This is different to the use analysis of a single sample collected at one point in time during an event. Sampling multiple times during a rainfall event will provide data on how the concentration of pollutants varies in magnitude over a single event. This data should be used to influence the design of the stormwater treatment and collection systems for stormwater harvesting and reuse schemes. If Blacktown City Council had this water quality data collected in the monitoring project prior to the design of the Angus Creek Stormwater Harvesting Scheme the method used to collect the stormwater from the creek would have been designed differently. This new harvesting system would minimise the collection of stormwater that is high in salts that are foreseen to become an issue in the future due to accumulation impacts.