

Stormwater sand filters in water-sensitive urban design

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Abstract

This paper investigates the suitability of sand filters for harvesting and treating stormwater for non-potable reuse purposes. A stormwater sand filtration device was constructed in a small urban catchment in Sydney, Australia. A sand filter is typically used in water-sensitive urban design (WSUD) as a component of a treatment train to remove pollution from stormwater before discharge to receiving waters, to groundwater or for collection and reuse. This paper describes an 18 month field study undertaken to determine the effectiveness and pollutant removal efficiency of a sand filter, and the differences in the pollutant removal efficiency of two grades of sand. A comparison of pollutant removal with previous literature on sand filters showed similar efficiencies but nutrient removal was higher than expected. A further unexpected result was that the coarse filter media performed as well as the fine media for most pollutant types and was superior in suspended solids removal. Improved modelling equations for predicting suspended solids and total phosphorus removal in sand filters are also presented in this paper.

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