ABSTRACT

Of the total amount of domestic potable water used in Perth, 43% is used for irrigation (MWA, 1985). Some people have suggested the reuse of greywater to reduce the use of potable water. Greywater is wastewater that originates from bathroom and laundry sinks, showers, and in some cases, the kitchen sink (Rose et al., 1987).

A community garden project in South Fremantle called King William Park (KWP) was begun in 1994. Part of the project involves the sub-surface irrigation of two areas in the park by greywater from two nearby houses. My project therefore involved assessing the environmental and health impacts of the greywater reuse at the park and to obtain information that could be used in other greywater reuse systems.

The first part of the project involved the characterisation of the greywater for certain chemical and biological parameters (EC, pH, TSS, BOD, PO_4-P, T-P, NO_3-NO_2, K-N, T-N and faecal coliforms). The reviewed literature and the characterisation showed that greywater is not the harmless product which many people believe it to be. In particular, phosphorus (P) and faecal coliform (FC) levels are very high.

The second part of the project involved the use of soil columns containing the sandy soil from KWP, the 85% red sand/15% red mud (with 5% of the red mud being gypsum) (RS-M) used in one irrigation field in KWP, and a humus (the second irrigation field contains organic matter which will form a humus in the future). Greywater was applied to the columns and tested for EC, pH, flow rate, P and FC.

The EC and pH levels of the effluent from all three soil types should not pose environmental problems for nearby waterbodies. The flow rate was reduced when greywater was added to the columns and to soil containing finer particles (RS-M). The sandy soil had minimal P removal capacity and would result in the pollution of waterbodies if used as an irrigation field. The RS-M had excellent P removal capacity and would not result in the pollution of waterbodies. The humus added P to the effluent and could not be used as an irrigation field.
The sandy soil and the RS-M mix reduced FC numbers in the greywater, and the humus often added FC's to the effluent. However, the FC numbers remaining in the effluent from all three soils was much higher than the standards for above-ground irrigation. Although, no solid conclusions could be drawn about the FC removal capacities of the sandy soil and the RS-M until longer soil columns are used.

A batch P sorption experiment was conducted using the RS-M. This test underestimated the P removal capacity of the soil when compared to the column experiment.