The simple modelling method for storm- and grey-water quality management applied to Alexandra settlement

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Abstract

Discharges from informal settlements cause numerous adverse water quality impacts on urban areas and on receiving waters. These problems reflect local conditions with respect to economic development, level of environmental protection (including the associated infrastructure), institutional arrangements and public awareness. Development of comprehensive tools for selection of drainage management interventions, even at planning levels, is still at its early stages in South Africa. Municipalities in South Africa face many challenges in identifying, assessing and selecting the right interventions and/or strategies to address the impacts of land use on receiving waters. A spreadsheet-based model was developed in this study specifically to assist in identifying, selecting and evaluating interventions to manage storm- and grey-water quality. The model also consists of modules: to quantify water quality management objectives (load reduction targets) of pollutants of concern, to formulate implementation strategies by combining different mixes of interventions at different levels of implementation, and to cost and select the optimum management strategy. In the Alexandra settlement investigated, the identified interventions to achieve management objectives optimally consist of educational programmes, erosion and sediment control, street sweeping, removal of sanitation system overflows, impervious cover reduction, downspout disconnections, removal of illicit connections to storm drains, establishment of riparian buffers, use of rainwater tanks and exfiltration systems.

Keywords: stormwater quality, non-structural control, structural control, management interventions.