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### Developing strategies for the disposal and use of greywater in the non-sewered areas of South Africa

This paper describes the strategies currently being developed as part of a comprehensive study into the management of greywater in the non-sewered areas of South Africa (SA). In this context greywater has been identified as the wastewater that is produced from household processes (e.g. washing dishes, laundry, bathing) without input from toilets, and non-sewered areas are defined as those areas without on-site waterborne sanitation. These are generally sub-economic or informal settlements in urban or peri-urban areas, inhabited by communities who have an average household income of less than US\$6 per day. Communities with dysfunctional or inadequate sewerage systems (particularly communal toilet facilities) have also been included in the definition of non-sewered areas.

Greywater management initiatives in South Africa have fast been gaining momentum as the pressures of increasing populations and poor or inappropriate service provision have resulted in the generation of surface and groundwater pollution, which represent potentially major threats to community health and the receiving environment. Management of greywater is totally dependent on the level of provision of effective services (water, sanitation and solid waste), and the strategies for sanitation in particular are relevant. Basic water and sanitation services in South Africa often comprise on-site dry Ventilated Pit Latrines (VIPs) or similar, coupled with a communal water point. In the absence of a suitable sewerage system, greywater is generally tossed onto the ground outside the dwelling. It is generally accepted that controlling the disposal and reuse of this greywater, particularly in high-density settlements, will provide overall benefits in terms of improved living conditions for these communities.

This particular project includes a major socio-anthropological component, as the key to successful management appears to lie with the attitudes of communities towards the greywater problem. There are two main outputs envisaged for the project; one at a macro level oriented towards Government, and one at a micro level, aimed at the communities themselves. The Government needs information regarding typical greywater generation rates for the sub-economic areas and the likely impact of changes in the service levels associated with water and sanitation services as it seeks to provide acceptable services for all its citizens. Communities, municipal planners and policy makers need guidance in the strategic management and possible reuse of greywater so as reduce negative impacts - it is these strategies which form the basis of this paper.

The first phase of this two-year project included the development and refining of the research tools whilst gathering data during on-site surveys of various settlements in the Western Cape, before extending the surveys to the rest of South Africa. The basic methodologies for the site selection, social survey, quantification and characterisation of the greywater generated by the communities, determination of the possible impacts of its disposal, and management of research information were also developed and improved during the first phase. An integral part of this phase was the identification of previous research into planning, strategies and procedures for sanitation provision, greywater reuse in terms of sustainable sanitation, and the management of water quality effects on settlements.

The following key findings from the Western Cape surveys have informed the strategies being developed, which will be refined further during the remainder of the project:

- Water management is culture-bound and depends on how the community perceives the problem of water service levels in relation to government promises and perceived service provision in more affluent areas. There are also language, culture and gender challenges that need to be overcome.
- The management of greywater should be included at the planning stage for the provision of water services to low-income settlements.
- The recipient communities should ideally be involved in the decision-making process, as well as in the implementation and operation of the water systems, in order to ensure “buy-in” and thereby enhance the likely success of the service delivery. This will involve education and training so that communities are able to take responsibility of the systems.
- The local authorities need to be fully involved in the planning, implementation and maintenance of all water services, as well as in liaison with the communities regarding these services.