

ABSTRACT

The Development of a Gravity Fed Microfilter for Potable Water Production in Remote Rural Areas

V L Pillay, K Pikwa, T Dlamini

Dept of Chemical Engineering, Durban University of Technology, P O Box 1334, Durban, 4000,
email : pillayvl@dut.ac.za, tel : 0824431921

The provision of potable water to remote rural areas poses unique challenges. These include :- the lack of electricity, difficult topographies, the lack of water impoundments such as dams, and the lack of technical skills amongst the local population. In most instances, water is fetched from a river in buckets and carried back to the household where it is consumed without any form of purification. The negative health effects of such practices are obvious.

It is now widely recognized that microfiltration (MF) and ultrafiltration (UF) offer various advantages over conventional chemical treatment methods for the production of potable water from non-saline raw waters. However, to date, it has not been possible to implement MF or UF systems in remote rural regions, due to the challenges stated above.

This project concerns the development of a simple gravity-fed MF system for potable water production in remote rural households. An inexpensive and robust flat-sheet MF module has been developed, based on woven fabric MF material. These modules have subsequently been incorporated into a very simple system aimed at individual households. Trials to date indicate that the performance of the system is more than adequate for the target application. About 20 L of permeate can be obtained in about 0,5 hours. The permeate turbidity is generally < 0,5 NTU for feed turbidities ranging from 50 NTU to over 300 NTU. The membranes can be easily cleaned by simply scrubbing them.

This paper will discuss the development of the remote rural water treatment system (RRWTS) and its potential applicability in developing economies.