Desalination and Water Treatment
www.deswater.com

41 (2012) 240–248
March

doi: 10.1080/19443994.2012.664721

Taylor & Francis
Taylor & Francis Group

Microbiological quality of drinking water in urban communities, Rawalpindi, Pakistan

Imran Hashmi*, Sara Qaiser, Shaukat Farooq

Institute of Environmental Sciences and Engineering (IESE), School of Civil and Environmental Engineering (SCEE), National University of Sciences and Technology (NUST), H-12, Islamabad, Pakistan
Tel. +2 (051) 90854303; Fax: +2 (051) 90854303; email: hashmi71@gmail.com

Received 29 July 2011; Accepted 17 January 2012

ABSTRACT

Bacterial contamination and residual chlorine were investigated over a three month period in four different areas of Rawalpindi city namely Ratta Amral (R1), Satellite town (R2), Westridge (R3), and Tench Road (R4). Treated water from Khanpur and Rawal Lake Filtration Plant is supplied to these communities, which treat surface water with conventional processes (coagulation, flocculation, and sedimentation). Eight sampling sites were chosen from each area to give wide geographic coverage and correspondingly, wide range of water residence times. The drinking water quality in the distribution network was evaluated by measurements on water samples taken from the water source, overhead reservoir and residential taps. Parameters include temperature, pH, turbidity, total dissolved solids (TDS), conductivity, total organic carbon (TOC), disinfectant residuals, coliforms, and Spread plate count (SPC) as per standard methods. Significant losses were observed in both chlorine and chloramine residuals in R1 and R4 areas that may result in bacterial regrowth. Coliform bacteria were detected in all areas except at sampling sites of R2. TOC varied from 0.39 to 5.97 mg/L. Chlorine residual at consumer end ranged from below detectable limit (BDL) to 0.36 mg/L. TDS varied from 141.1 to 512 mg/L and conductivity ranged between 286.3 and 1023 μS/cm, while turbidity fluctuated between 0.16 and 4.10 NTU. Evaluation of the treated water quality indicates that the water is not suitable for drinking and requires improvement in conventional treatment followed by implementation of monitoring and surveillance of the distribution network. The finished water quality fails to meet the level of standards as described by WHO for potability mainly in terms of its microbial characteristics.

Keywords: Disinfectant residual; Coliforms; TOC; Drinking water; Distribution network

*Corresponding author.