Desalination and Water Treatment
www.deswater.com
19 (2010) 318–324
July
1944-3994 / 1944-3986 © 2010 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2010.1940

The Geographical Information System (GIS) based water quality assessment of a drinking water distribution system in the Denizli City

Abdullah Cem Koc[a]*, Fehiman Ciner[b], Selcuk Toprak[a], Huseyin Selcuk[b], Burcu Aktan[b]

[a]*Pamukkale University, Engineering Faculty, Department of Civil Engineering Kinikli, 20070, Denizli, Turkey*
Tel. +90 (258) 2963395; Fax +90 (258) 2963382; email: a_c_koc@pau.edu.tr
[b]*Pamukkale University, Engineering Faculty, Department of Environmental Engineering, Denizli, Turkey*

Received 25 November 2009; Accepted in revised form 1 April 2010

ABSTRACT

Nowadays, continuous, healthy water supply and total water quality management have emerged as an important issue in engineering applications. In a wide ranging assessment, the quality of the drinking water is being monitored in the distribution system, until it is supplied to the end user. It includes regular sampling and testing performed for assessing compliance with guideline values. The major purpose of this study was to monitor, evaluate and control the water quality in distribution system by using GIS to assess the drinking water quality in Denizli. The drinking water necessity in Denizli is supplied from various drinking water sources as Gokpinar, Derindere, Kozlupinar and Benlipinar springs and more than 30 deep wells. The storage reservoir volume fed by the water sources varies from 20 m^3 to 5500 m^3. Almost 56% of Denizli drinking water distribution system consists of asbestos cement and cast iron pipes. The non-revenue water in the water supply system is about 50%. In the old distribution systems, epidemic illness risk is at high rate and the free residual chlorine has to be kept at certain amount. Therefore, the free residual chlorine amount has to be measured during the summer months against the epidemic danger. The chlorine reacts with the organic matter and the amount decreases; it forms the carcinogenic trihalomethanes (THMs). In this study, three organic matter precursors; namely total organic carbon (TOC) concentration, UV absorbance at 254 nm and free residual chlorine concentration has been measured in 30 points at various parts of the Denizli city water distribution system and mapped by GIS.

Keywords: Water distribution system; Water quality; TOC; UV_{254}; Free residual chlorine; GIS; Denizli

* Corresponding author.