Desalination and Water Treatment
www.deswater.com

41 (2012) 335–341
March

doi: 10.1080/19443994.2012.664724

Taylor & Francis
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Natural zeolite—a versatile commodity—some retrospectives in water cleanup processes

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Received 9 November 2011; Accepted 22 January 2012

ABSTRACT

The objective of this paper is to review some of the practical applications of clinoptilolite-rich tuff, deposited at the Eastern Slovakian repository Nižný Hrabovec, which has been used for inland water treatment and purification processes in the last 25 years. Since this field is wide, this overview is limited and highlighting only those water purification and treatment processes, which have been realized in industrial scale up or pilot applications. The zeolite ion exchange pilot installation with a hydraulic loading rate of 900 L/h was situated at the field experimental facility of Water Research Institute in Vajnory, the closed vicinity of Bratislava, during the autumn of 1986. Surface water purification by means of chemical coagulation and flocculation supported by the powdered natural zeolite was carried out in 1984 to save the drinking water reservoir (upper part of Ondava river) settled by about 10,000 equivalent inhabitants. Ammonia removal from tannery wastewater using the clinoptilolite-rich tuff with chemical regeneration and regenerant recovery by air stripping was carried out for several months in 1987 at the mixed Wastewater Reclamation Facility in Zlin (Moravia region). Zeocem company is currently producing manganese-dopped grain-sized clinoptilolite-rich tuff under the trade mark Clinopur, purchased for water purification and for the removal of Mn with Fe pollutants removal.

Keywords: Clinoptilolite-rich tuff; Ammonia removal; Ion exchange; Regenerant recovery
Water purification; Air stripping; Coagulation and floculation; Fe and Mn removal