Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2020.26362

206 (2020) 34–43
December

Effects of water transfer on improving water quality in Huancheng River, Chaohu City, China

Feng Deng[a,*], Zhongkai Liu[b], Lu Zhang[c], Xiaopeng Hu[d], Qiwen Guan[e]

School of Environmental Science and Engineering, Nanjing Tech University, Nanjing, Jiangsu 210000, China, Tel. +86 13851488840; Fax: +86 (25)58139652; email: dengf99@126.com (F. Deng), Tel. +86 13813850139; Fax: +86 (25)58139652; email: 459710700@qq.com (Z.K. Liu), Tel. +86 19850079336; Fax: +86 (25)58139652; email: 1397381362@qq.com (L. Zhang), Tel. +86 18305196767; Fax: +86 (25)58139652; email: 358911387@qq.com (X.P. Hu), 5 Tel. +86 13512512424; Fax: +86 (25)58139652; email: lzkzyc001@outlook.com (Q.W. Guan)

Received 2 January 2020; Accepted 18 July 2020

ABSTRACT

Urban river pollution is an urgent environmental problem in China at present and water transfer has been proven to be a cost-effective method to resolve the issue. In this study, the effects of water transfer on improving water quality in Huancheng River, Chaohu City were investigated. The initial test indicated that water transfer could enhance the aeration while decreasing total phosphorus and chemical oxygen demand (COD_{cr}); however, a significant difference in the improvement effect was observed between two sections. Subsequently, the water flow was increased, which led to an enhanced improvement effect with a smaller difference observed between the two sections. Furthermore, a total pollutant control model was constructed with COD_{cr} as the index. The deviation between the simulation results and experimental data was in the range of 2%–20%. The results indicate an average COD_{cr} of below 28.99 mg/L under a water flow of above 1.67 m^3/s. The experimental and simulation results of this research provide managers with guidance to optimize water transfer plans.

Keywords: Huancheng River; Water transfer; Water quality improvement; Pollutant control model

* Corresponding author.