

Mizera, J., Szymaniec, B., Folwaczny, M. Groundwater Nitrate Removal in the Example of Wierzchowisko Water Intake Exploited by 'Wodociagi Czestochowskie' Waterworks. *Ochrona Srodowiska* 2013, Vol. 35, No. 3, pp. 35–38.

Abstract: The paper presents lessons learnt from seven-year exploitation of a system for groundwater nitrate removal by biological denitrification. This process was implemented at Wierzchowisko (Mykanow, Silesian Voivodship) withdrawing water from upper Jurassic carbon deposits. Raw underground water complies with the quality recommendations for drinking water except nitrates (NO_3^-), which amount to about $80 \text{ gNO}_3^-/\text{m}^3$ (permissible limit $50 \text{ gNO}_3^-/\text{m}^3$). Nitrate removal plant opened in 2006, with capacity of $500 \text{ m}^3/\text{h}$, comprises of the following technological installations: biofilters (kermesite bed; $\text{C}_2\text{H}_5\text{OH}$ and H_3PO_4 dosing), aerators (FeCl_3 dosing), rapid filters (kermesite bed) as well as sorption filters (WG-12 active carbon). The set of processes performed at these facilities allows 80% effectiveness in regard to groundwater nitrate removal. Due to the final ozone water disinfection, a possibility of bromate formation was noted as a result of oxidation of bromides present in the water (approx. $35 \text{ mgBr}^-/\text{m}^3$). The ozone dose was lowered in order to limit this unfavorable phenomenon and thus the bromate concentration in the purified water was reduced to $<3 \text{ mgBrO}_3^-/\text{m}^3$ (permissible limit $10 \text{ mgBrO}_3^-/\text{m}^3$).

Keywords: Groundwater treatment, nitrate removal, heterotrophic denitrification, bromide, ozonation.