Pruss, A., Maciolek, A., Lasocka-Gomula, I. Effect of the Biological Activity of Carbon Filter Beds on Organic Matter Removal from Water. *Ochrona Srodowiska* 2009, Vol. 31, No. 4, pp. 31–34.

Abstract: A full-scale study was conducted at the Water Treatment Plant of Gruszczyn, which supplies water to the municipalities of Poznan and Swarzedz. The groundwater treated there is characterized by elevated concentrations of manganese, iron and organic compounds (TOC, permanganate COD, color, UV absorbance). The water treatment train applied includes: open aeration, filtration I^{o} (anthracite-sand bed), filtration II^{o} (granular active carbon bed; GAC bed) and disinfection. GAC samples collected at various depths of the adsorption columns, as well as samples of the influent to, and the effluent from, the adsorption columns were made subject to analysis. GAC samples were analyzed for esterase activity (EA) using the fluorescein diacetate (FDA) test. The samples of influent and effluent water were analyzed for dissolved oxygen, free carbon dioxide, pH, total alkalinity, TOC, permanganate COD, UV absorbance (λ=254 nm) and total number of bacteria at 22 °C. The study has revealed that all the GAC beds in the adsorption columns operated by the Gruszczyn Water Treatment Plant were biologically active. The biological activity of the GAC beds was found to depend on the duration of the filter cycle after backwash. Backwash produced a periodic reduction in the biological activity of the GAC beds, which was followed by a gradual increase with the duration of the filter cycle. The efficiency of organic matter removal from the water in the GAC beds failed to exceed 40%, which seems to be attributable to the fact that the treatment train applied does not include ozonation as a prior step to filtration II^{o} which involves GAC beds.

Keywords: Water treatment, filtration, sorption, active carbon, carbon filter, biological activity, biofilm.