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Changes of heavy metal concentration in rainfall wastewater in urban catchment

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ABSTRACT

The article presents the results of a study into rainfall wastewater pollution in a catchment area of 62 ha, located in the central part of the city of Kielce, where the construction of a large-format retail facility was conducted. The samples of stormwater were collected to determine pH, total suspended solids (TSS), and heavy metals (Ni, Cu, Cr, Zn, and Pb). The performed analysis of variance (ANOVA) shows that the average concentrations of TSS in the stormwater samples collected during the construction works (1,913–57,814 mg dm^{-3}) were considerably higher than that recorded in the period preceding these works (106–126 mg dm^{-3}) and after their completion (978–1,089 mg dm^{-3}). The conducted investigation showed that the highest average concentrations of nickel (0.30 mg dm^{-3}), copper (0.43 mg dm^{-3}), chromium (0.33 mg dm^{-3}), and zinc (2.40 mg dm^{-3}) were recorded in stormwater samples taken in 2011. On the other hand, the ANOVA results did not indicate significant differences in the heavy metal concentrations in stormwater samples collected during the freshets in 2010 and 2012.

Keywords: Rainwater; Heavy metals; Total suspended solids; Urban catchment

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