

Bielski, A. Advection Transport of River Pollutants with Bi-directional Diffusion in the Plane Perpendicular to the Direction of Flow. *Ochrona Srodowiska* 2012, Vol. 34, No. 2, pp. 19–24.

Abstract: The paper presents an analytical solution of the differential equation that describes advection mass transport with bi-directional diffusion in the plane perpendicular to flow under conditions of unsteady state. The solution obtained makes it possible to define the distribution of pollutant concentrations in the river cross-section and determine the coefficient of variation in the concentrations of the pollutants. Knowledge of the coefficient of variation offers the possibility for determining (up to the extent desired) the time during which the pollutants and riverine water become intermixed. To visualize the method proposed, an example was presented of time-related evolution of the pollutant concentration map, and a method was suggested, which shows how to produce such maps in the case of several pollution sources.

Keywords: River pollution, advection, bi-directional diffusion, unsteady state.