



## **Comparison of Flow and Sedimentation Pattern for three Designs of Storm Water Tanks by Numerical Modelling (CFD)**

N. Vosswinkel<sup>1\*</sup>, A. Schnieders<sup>2</sup>, C. Maus<sup>1</sup>, S. Ebbert<sup>1</sup>, R. Mohn<sup>1</sup> and M. Uhl<sup>1</sup>

<sup>1</sup>Muenster University of Applied Sciences, IWARU (Institute for Water Resources Environment), Corrensstr. 25, 48149 Muenster, Germany

<sup>2</sup>Ruhrverband, Kronprinzenstraße 37, 45128 Essen

\*Corresponding author, e-mail vosswinkel@fh-muenster.de

### **ABSTRACT**

Sedimentation tanks are commonly used as storm water treatment facilities to reduce the emission of particulate matter. Insufficient hydraulic conditions are likely to cause suboptimal conditions for sedimentation. Recommendations regarding the specification of classical tank dimensions and proportions are defined in the German ATV Standards (DWA-A 166-Draft [2010], ATV-DVWK-M 176 [2001]), which are based on studies by Muth [1992]. Although, these standards offer a broad range of possible design characteristics, detailed specifications for the optimal design of tanks are not available. Investigations by Uhl et al. [2009] show the need to study the interrelation of dimensions of sedimentation tanks and their performance in detail. In this study, the sedimentation efficiency of different types of rectangular settling tanks is investigated with a three-dimensional numerical model for turbulent multiphase flow. The depth of a tank has been identified to be the dominant feature in regard to particle separation.

### **KEYWORDS**

CFD, modelling, combined sewer overflow tank, storm water settling tanks, sedimentation efficiency