University of Stuttgart
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Institute for Sanitary Engineering, Water Quality and Solid Wastemanagement | **ISWA**

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Study to reduce micro pollutant emissions from the wastewater system into the river Körsch

Aim of this study is to investigate and asses technological measures to reduce the emission of micro pollutant loads from the sewer system into the upper river Körsch. Within this approach, the entire wastewater system, consisting of the wastewater treatment plant (WWTP) and the sewer system including the combined sewer overflows (CSO) is evaluated in an integrated approach.

In the first step, the micro pollutant emissions of the WWTP Möhringen and Plieningen of the state capital Stuttgart were investigated. Representing different physico-chemical properties and different entry pathways (wastewater, stormwater, surface runoff) 69 substances were chosen for the analysis.

The results show that the substances found in the surface water/wastewater system differ greatly in their occurrence and fate depending on their origin. For 20 substances, the load emissions by CSOs were found to be greater than from the WWTP effluent. Commonly practiced dry weather investigations greatly underestimate the load of substances originating from surface runoff. Ten of these substances exceeded environmental quality standards (EQS) of the German surface water ordinance. The substances Diclofenac, Terbutryn, Mecoprop, Fluoranthen and Benzo([a]pyren exceeded the annual average concentration (AA-EQS). The polycyclic aromatic hydrocarbons (PAH) Benzo[b]fluoranthen, Benzo[k]fluoranthen and Benzo[ghi]perylen exceeded the maximum allowable concentration (MAC-EQS) significantly in all measurement locations.

To achieve a good chemical status of the receiving water, an improvement of the WWTP is not sufficient. Only a combination of measures on the WWTP and in the sewer system can lead to a significant reduction of micro pollutants in the river Körsch. The biggest global load reduction could be achieved with advanced treatment technologies on the WWTP in combination with a real time flow control. However, this scenario has also been proven as the most expensive. Regarding the PAH, not even a combined approach would lead to accordance with the EQS. Only measures at the source of the pollution would result in a significant improvement.

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Figure: discharge point in rainy weather

Figure: discharge point in dry weather