

Pollution characterization and source analysis of the wet weather discharges in storm drainages

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ABSTRACT

For storm drainages interconnected with inappropriate or illicit sewers, urban wet weather discharges (UWWD) is one of the major factors that affect the receiving water environment. In this study, the UWWD pollutants of SS, COD, TN, TP and NH_4^+-N , as well as mass first flush ratio (MFF) at Caohejing storm drainages in Shanghai, China, were characterized. The results indicate that the first flush effect of runoff pollution was only observed in the events with the large rainfall intensity, early peak rainfall and low initial pollutant concentrations. Deposited pipe sediments and interconnected wastewater had larger contribution to the pollutant variations than runoff pollution. The decreasing trends of the pollutant concentrations were less obvious in smaller rainfall events. The cumulative rainfall amounts before the downward inflection points of UWWD were different in most moderate and heavy rainfall events ranging from 12.1 to 65.7 mm. MFF analysis shows that the total rainfall volume is the key factor affecting MFF, and the events with an early peak rainfall, less antecedent volume discharged, or a long interval time between two discharges had more obvious first flush effects. The data presented in this study will help the decision makers to better intercept pollutants in different types of rainfall and antecedent discharges. It also serves as a reference for UWWD research in similar drainage systems.

Keywords: Urban wet weather discharges (UWWD); Pollutant concentration variations; Mass first flush ratio (MFF); Discharge load analysis

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