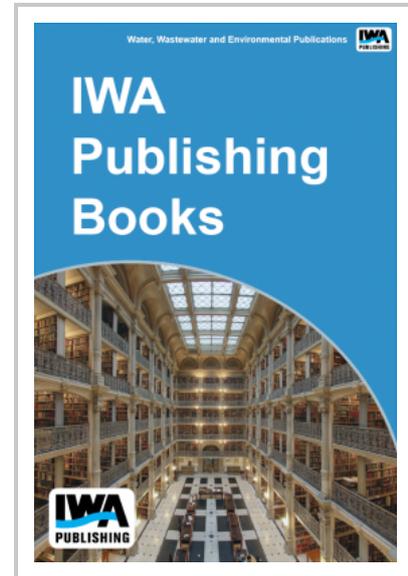


# Contributions of Household Chemicals to Sewage and Their Relevance to Municipal Wastewater Systems and the Environment

Of the total number of consumer product chemicals the U.S. Environmental Protection Agency has identified, approximately 500 are considered high production volume (HPV) chemicals. This study investigated the occurrence and fate of high production volume household chemicals in wastewater systems. The study was initiated with a comprehensive review on HPV organic chemicals in household commodities and their contributions to municipal wastewater treatment systems. The comprehensive review presented the basis to compile a database on HPV chemicals and organic compounds in household commodities that have the potential to affect wastewater processes and effluent qualities. The occurrence of select HPV target compounds during wastewater treatment was studied by collecting composite samples of raw sewage and final treated effluents at seven full-scale treatment plants employing different operational conditions. Of the 26 household chemicals targeted in this study, 20 compounds were consistently detected in raw influents of full-scale wastewater treatment plants. Chemicals that are primarily used in products applied outdoors were generally not present in raw influent samples. The majority of compounds present in personal care and cleaning products generally appeared in all influent samples with concentrations of 2-phenoxyethanol (a preservative with various uses) and menthol (a fragrance with various uses) consistently exhibiting the highest concentrations of all compounds. The efficacy of advanced wastewater treatment processes to achieve removal and destruction of selected target compounds was studied through controlled lab- and pilot-scale studies (i.e., MBR, ozone, AOP). In general, biological treatment resulted in partial or complete removal (>80%) indicating that biological treatment is a good treatment option for HPV household chemicals.

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