Microbial counts and antibiotic resistances during conventional wastewater treatment and wastewater ozonation.

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Abstract

In view of the increasing interest in the occurrence and spread of antibiotic-resistant bacteria due to wastewater treatment systems into the environment, total colony counts and antibiotic-resistant bacteria were determined in regard to a conventional wastewater treatment plant and its upgrade with a wastewater ozonation. To cope with the elimination of conventionally not sufficiently decimated micropollutants, the Eifel-Rur Waterboard built a full-scale ozonation plant at the stream Wurm, which is strongly influenced by WWTP discharge. To evaluate the effect of wastewater ozonation on the receiving water's biocenosis, extensive monitoring of the WWTP and its receiving water is performed before and after implementation of ozonation treatment and in preliminary pilot-scale ozonation experiments. Total colony counts showed no significant difference between the stream Wurm upstream and downstream of the WWTP and were slightly below the average of comparable investigations. Antibiotic resistances showed only a little differences between WWTP and the stream samples. Furthermore, no accumulation of antibiotic resistances was found at the

conventional WWTP. Pilot-scale ozonation yielded a reduction of total colony counts of fecal indicator bacteria Escherichia coli and Enterococci after ozone treatment. The pilot-scale experiments gave no indication that ozone treatment leads to a rise in antibiotic resistances against selected antibiotics of different antibiotic classes.

Involved units

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