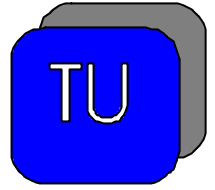




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Endbericht zum Projekt MA22-4510/99

EMISSIONEN VON OZONBILDENDEN UND KLIMARELEVANTEN SPURENGASEN AUS KLÄRANLAGEN

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ABSTRACT

Within the scope of the present project atmospheric emissions of nitrogen oxides (NO_x), nitrous oxide (N_2O), methane (CH_4), non-methane hydrocarbons (NMHC), carbon dioxide (CO_2), particulate organic carbon (POC) and individual polar organic components from the pilot wastewater treatment plant of the main sewage treatment plant Simmering were investigated. During the two-week measuring period the plant was operated under two different working conditions. Under hybrid-conditions the whole wastewater is injected into the first aeration tank. Under bypass-conditions 10 to 40% of the pre-treated wastewater are directly injected into the second aeration tank.

Carbon monoxide was used as a tracer to determine the dilution coefficient for the calculation of the emissions. By measuring the concentrations in the known flux of the off-gas and taking the dilution into account the emission rates were determined. The daily emissions of the plant were also transferred into emissions per capita equivalent (c.e.) and per m^3 wastewater. The emission rates were further put into relation to CO_2 to obtain normalized data that can be used for emission inventories.

Emission rates for a number of individual polar components were obtained, especially for the non-saturated acids Octadecenoic and Tetradecenoic acid, but as well for Hexadecanoic and Octadecanoic acid, Nonanoic acid and Pyruvic acid, Oxalic acid and Azelaic acid.

Emissions of methane were 0.09-0.18 g/c.e. and lower than the data in literature at 0.82 g/c.e. (Mc Innes, 1996). The contribution of sewage treatment plants to the total emissions of N_2O in Vienna account for 3-8%.

Emission rates of NO_x , that are not available in literature yet, were relative low at 0.65-2.8 $\text{gNO}_2/\text{c.e.}$. Emission rates of NMHC were 0.014 g/c.e. under both operating conditions. From this we conclude that even after the implementation of denitrification stages in the Viennese wastewater treatment plant emissions of trace gases will still remain very low.