

Reference case

Removal of benzidine from groundwater

The background

Groundwater is an ideal and reliable source in the production of drinking water. However, due to human activity such as industry and agriculture this source is frequently contaminated with micropollutants, for instance industrial chemicals and pesticides. These micropollutants infiltrate the soil and groundwater and are by nature difficult to get rid of, many of them toxic. Water scarcity is a growing issue worldwide and contamination of groundwater by micropollutants aggravated the problem. A reliable way to break down micropollutants is essential.

The case

A client in Switzerland wanted to investigate the possibilities to remove benzidine and a couple of other micropollutants from their extracted groundwater. The maximum final concentration of benzidine allowed was <1,5 ng/l which required a >95% removal efficiency.

The solution

A full scale solution would suffice with a single full Advanox™ reactor with robust optimization possibilities for both UV-C and hydrogen peroxide dosing. Van Remmen UV Technology together with Jotem Waterbehandeling BV has developed a small scale test unit for Advanox™ that was used in this project. This set-up has a test ca-

capacity of up to 500-2000 L/h, and it was demonstrated at 500-1000 L/h for this case.



Facts

Contractor

Anonymously

Location

Switzerland

Purpose

Benzidine removal from groundwater

Solution

Advanox™ Focus series

Results

The process was demonstrated successfully in September 2020. A dose response trial was used to see the effects of different UV-C and H₂O₂ dose combinations. Benzidine as well as a couple of other micropollutants of interest and their metabolites were reliably reduced to under the detection limit. In the case of benzidine this

was <1 ng/L, or >99% removal efficiency.

For a full scale Advanox™ installation at >99% removal efficiency the energy consumption would be 0,14 kWh/m³. Based on information from the client the costs of a full scale Advanox™ installation would be competitive with and more flexible than activated carbon.



Customer quote:

Client representative: *"As part of a pilot test, van Remmen was to demonstrate their AOP process for the removal of benzidine in water. As predicted in advance, the process delivered promising results. Using the pilot plant available, it was easy to change various parameters to find the optimal settings. The cooperation with Ton [van Remmen] and Kaspar [Groot Kormelinck] was very straightforward, pragmatic and collegial. As a result, not only the test program created in advance, but also the entire pilot test was completed in no time at all. The guys know something about their craft."*