

ABSTRACT

The BAT Knowledge Center, established by the Flemish Government at VITO, is tasked with inventorying, processing, and disseminating information about environmentally friendly techniques. Additionally, the knowledge center must advise the Flemish government on concretizing the concept of BAT. This report maps out the BAT for the swimming pool sector. It is a revision in the series of BAT studies that the BAT Knowledge Center at VITO compiles and publishes via the EMIS website.

Swimming pools have high water consumption and must subsequently disinfect it to ensure good water quality (both chemically and bacteriologically). They often use chlorine as a disinfectant, which leads to disinfection by-products such as chlorinated compounds (AOX) that can be environmentally harmful. Additionally, indoor swimming pools consume a lot of energy to heat the water and the spaces. The objective of this BAT study is to investigate how the high water and energy consumption and the emissions of chlorinated compounds in the wastewater can be reduced.

Initially, the reduction of disinfection by-products was investigated. Both preventive measures (reducing organic load) and alternative disinfectants were considered. Additional treatment techniques that can be applied before and after the standard filtration step in the process were also examined. Subsequently, techniques to save water and energy were described, in combination with good housekeeping measures. Finally, end-of-pipe techniques for further discharge and emerging techniques that cannot yet undergo a BAT evaluation at the time of writing were considered.

Based on these data, BAT techniques were selected and derived for both water treatment and water and energy savings (BAT selection criteria). This resulted in a step-by-step plan for implementing BAT in new or existing swimming pools. The step-by-step implementation (or design) aims to initially avoid or reduce environmental problems (e.g. water and energy consumption). Remedial measures are then included. This approach not only leads to environmental benefits but also financial savings, as techniques aimed at remediation become unnecessary or can be dimensioned smaller.

Subsequently, recommendations and suggestions were included to adjust the VLAREM regulations (sectoral conditions) so that more water and energy saving techniques are applied in swimming pools. A recommendation was also made to start AOX monitoring at Flemish swimming pools. Recent and representative measurement data were insufficient, making it impossible to re-evaluate the currently imposed AOX emission standards in specific environmental conditions. This monitoring obligation will provide a complete and accurate picture of the concentration of AOX components in discharge water across all VLAREM regulated swimming pools (with circulation), allowing for correct emission standards to be derived, which can then be linked to techniques. Finally, current gaps within the sector and areas where further research and technological development are necessary were identified.