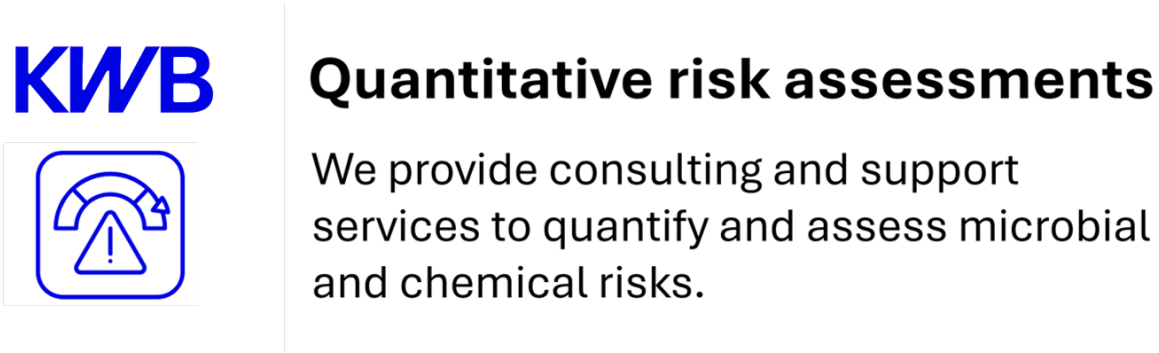
Product factsheet

KWB Risk assessments

Consulting or service offering (e.g. training)



Description

To facilitate the design and assessment of treatment trains for water reuse, KWB offers a consulting service to conduct **quantitative microbial and chemical risk assessments**.

In this context, KWB is supporting the development of an open source online tool for**quantitative microbial risk assessment (QMRA)**. Water reuse is increasingly motivated by climate change and water stress, and it's a solution for a more climate-resilient water supply and security. However, to understand your water-related system and ensure water reuse is safe, performing a risk assessment is necessary.

Our QMRA tool is a Django project that uses cutting-edge techniques to conduct quantitative microbial risk assessments. The simulations in the tool rely on an open source database developed within the research projects AquaNES, NEXTGEN, ULTIMATE and RECREATE. Our tool estimates the risk of infection for three reference pathogens (rotavirus, Campylobacter jejuni, and Cryptosporidium parvum) for multiple source waters and treatment scenarios.

Our QMRA tool provides two different options for the user to perform a first-stage risk assessment of a water supply system. In the first option, the user can select default values derived from international guideline documents and scientific literature (see database). In the second option, the user can create a custom scenario (treatments, exposure scenarios) and provide numeric values for input of interest to the user. In this way, the QMRA tool can be adapted to specific, local needs and values.

Users can also create their own treatments by providing a name and a short description of the treatment, as well as numerical values (LRVs) for the treatment's performance.

Additionally, users can create their own exposure scenarios. Exposure scenarios are represented by point estimates for the number of exposure events per year and the water volume ingested per event. Users can provide a name and short description for each exposure scenario.

In addition, KWB developed an **early warning exposure assessment tool (EWEX-tool)**. The EWEX-tool is a probabilistic tool developed within the PROMISCES project and extended with further features within the RECREATE project. It evalutes human exposure risks in circular economy routes involving water reuse and nutrient recovery.

It can be applied in various areas such as:

- Semi-closed drinking water cycles
- Groundwater remediation
- Water reuse for agricultural irrigation and/or industrial reuse
- Nutrient recovery

The model is based on Bayesian updating and combines literature, site-specific and modelled data. It handles high uncertainties and low data availability and evaluates reference risk quotients for substances such as PFAS and other iPMT substances.

As an output, it highlights the most relevant treatment steps, supports precautionary decision-making under data scarity and offers flexible, risk-based insights for prioritizing remediation efforts.

Target audience

Planners, investors or owners of: - Water reclamation plants - Nutrient recovery solutions - Drinking water plants - Growndwater remediation solutions

URL

https://kompetenz-wasser.de/en/forschung/dienstleistungen/qmra-tool

Technologies applied by the product

- **Desalination technologies**
- **Nutrient recovery**
- **Stormwater Management**
- **Wastewater treatment technologies for water reuse**

Costs

We will be happy to provide you with a quote at any time. Please contact: info@kompetenz-wasser.de

Case Study applying the product

Kalundborg, Denmark (RECREATE: since 2024)

https://mp.watereurope.eu/d/CaseStudy/56

Related tags

Nutrient recovery | groundwater | risk assessment | Water Reuse and Recycling