

Decontamination of PFAS-polluted Soil

Poly- and perfluorinated alkyl substances (PFAS) represent a special challenge for the remediation of soils and groundwater as well as for the cleaning of PFAS-contaminated infrastructure (especially fire-extinguishing systems). In particular, for large-scale contaminated sites, which can be as large as several square kilometers, there already exist redevelopment concepts.

Initial approaches focus on the forced elution of the PFAS from soils using conventional irrigation systems. Since the PFAS preferentially bind to protein structures of the TOC (Total Organic Carbon) of the soil, the addition of protein-containing material (biopolymers) to the rinse water could accelerate the elution of the PFAS. Technical proteins are ideal as a protein-containing material. In addition, there are probably other more inexpensive substances to test. Such forced elution can play a role not only in the above-mentioned, but also in other technical processes such as, *in situ* soil flushing, soil washing, or cleaning of fire engines and sprinkler systems (foam transition).

PFAS flushed into the groundwater or flushing water would then have to be removed. Groundwater is pumped out, cleaned and reinfiltreated. Rinse water from the soil wash would have to be cleaned in the same way before being reused. It is also unclear whether the flushing water from cleaning fire-fighting vehicles can be further concentrated for disposal.

A number of questions arise from this area, which could be investigated in several master's theses. Therefore, we are looking for motivated master students. The work will be conducted under the supervision of Prof. Dr. Rainer. U. Meckenstock (Aquatic Microbiology, UMB) and PD. Dr. U. Telgheder (Instrumental Analytical Chemistry) at the University of Duisburg Essen. Dr. Thomas Held from Arcadis will support the investigations.

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