



Environmental problem targeted

Per- and polyfluoroalkyl substances (PFAS) are a group of >5,000 anthropogenic chemicals that are extremely persistent and known to be potential bioaccumulative and toxic for humans and the environment.

The main exposure pathway for humans is the intake of food and drinking water. Areas around industrial production, manufacturing, application or waste facilities, such as landfills, have been found to be particularly contaminated by PFAS, resulting in the contamination of both surface and groundwater. The number of sites potentially contaminated with PFAS has been estimated to be ~100,000 in Europe.

Existing water treatment technologies are commonly based on granular activated carbon, resulting in poor performance for short-chain PFAS and decreasing removal efficiency due to filter saturation.

Project objectives

LIFE SOuRCE aims at demonstrating a novel on-site remediation approach for PFAS contaminated groundwater, based on a combination of surface-active foam fractionation (SAFF), phytoremediation (PHYTO), anion exchange (AEX) and electrochemical oxidation (EO).

Specific objectives are to:

- Demonstrate the feasibility of cost-effective innovative schemes for PFAS groundwater remediation at the pilot scale.
- Reduce the environmental impacts and remediation costs of PFAS remediation processes.
- Define the business model for the commercial exploitation of the innovative schemes developed within the project.
- Foster social awareness related to the environmental problem caused by PFAS.

THE TECHNOLOGIES TESTED AT HOVGÅRDEN

- SAFF** Surface active foam fractionation
- PHYTO** Phytoremediation
- EO** Electrochemical oxidation

Surface Active Foam Fractionation (SAFF) utilizes the PFAS physico-chemical capacity to attach to air bubbles to remove them from water. This capacity is the result of its hydrophobic and hydrophilic properties. In fact, bubbles are exceptionally effective in collecting PFAS, and once at the surface, PFAS can be easily removed by separation.

Electrochemical Oxidation (EO) uses boron-doped diamond electrodes to destruct PFAS enriched in the foam produced by the SAFF method. Boron-doped diamond electrodes are used to decompose very persistent chemicals like PFAS.

Phytoremediation (PHYTO) is used as a polishing step of the SAFF treated water. Plants can extract and accumulate PFAS, in particular the short-chain ones.

PROJECT PARTNERS

EURECAT, Centre Tecnològic de Catalunya, is a non-profit private foundation whose aim is to efficiently contribute to improve the competitiveness and the technological and sustainable development of companies by providing specialised services and carrying out R&D and innovation projects.

Envytech is a water treatment company specializing in treatment of complex waters and contaminants such as PFAS. Envytech has an extensive fleet of mobile water treatment plants, and are one of the leading water treatment specialists in Sweden.

ESOLVE is an environmental consultancy and engineering firm located in Barcelona founded in 2010. ESOLVE aims to be established as a reference company in the field of soil and groundwater decontamination reducing toxicological risks to people and ecosystems.

Laqua Treatment AB is a manufacturer of agricultural irrigation. Since 1995, the company has developed technology, software and hardware, to irrigate short rotation willow with society's waste products, such as landfill leachate, wastewater and sewage sludge.

Nova Diamant AB is specialized in diamond coatings for wear and low friction applications as well as Boron Doped Diamond (BDD) electrodes for water treatment applications.

SLU, Swedish University of Agricultural Sciences, is a world-class academic institution, and its mission is to develop the understanding and sustainable use and management of biological natural resources, in collaboration with the surrounding community.

SGI, Swedish Geotechnical Institute, is a governmental agency and research institute that works for sustainable use and management of land and natural resources, through research, knowledge dissemination and support to Swedish authorities.

Uppsala Water and Waste AB is a municipally owned provider of drinking water, wastewater, biogas and solid waste and recycling services to approximately 225 000 persons in the Uppsala area in Sweden.

