About the DEMEAU project

Demonstration of promising technologies to address emerging pollutants in water and waste water

Instrument FP7-ENV
Start Date 01/09/2012
Duration 36 months
Consortium 16 partners from 5 European countries
Project Coordinator Theo van den Hoven, KWR Watercycle Research, The Netherlands
Key Words Demonstration, innovation, water, wastewater, emerging pollutants, membrane filtration, advanced oxidation, bioassays, managed aquifer recharge, technologies, prototypes, standardization, end-user management, resilience measures

DEMEAU is a forward thinking research project that aims to address future threats to European water resources associated with emerging pollutants. Small concentrations of emerging pollutants are increasingly found in water resources due to the increased use of e.g. pharmaceuticals, industrial chemicals, and cosmetics. Technologies have been developed to deal with emerging pollutants. However, emerging pollutants are currently not included in standard monitoring programs and treatment routines in Europe. DEMEAU promotes the uptake of knowledge, prototypes and practices from previous EU research and focuses on four groups of promising technologies:

- Managed Aquifer Recharge (MAR)
- Hybrid Ceramic Membrane Filtration
- Hybrid Advanced Oxidation Processes
- Bioassays

The project demonstrates these technologies through action research with universities, research institutions, innovative small and medium enterprises (SME), launching water utilities and policy makers. Life Cycles Analysis (LCA) & Life Cycle Costing (LCC) show cost effectiveness and environmental suitability of the technologies and benchmark the novel technologies against existing ones. DEMEAU seeks cooperation with policy makers, regulators and standardization bodies at the Member State and European levels and aims at knowledge exchange between technology producers and users.

BIOASSAYS in Focus: IMPLEMENTATION OF NOVEL RAPID AND QUANTITATIVE BIOASSAYS FOR WATER QUALITY MONITORING

Recent technological developments have provided powerful quantitative bioassays to effectively measure a wide range of major classes of toxicants. These effect-based tools hold great promise in being introduced and integrated in current monitoring strategies, albeit facing barriers such as a lack of current legislation.

The DEMEAU Work Area on Bioassays focuses on compliance of selected bioassays with current and future directives and standards as well as the technical implementation of a selected and validated rapid toxicity screening panel at a selection of water utilities. As outcomes, the Work Area will provide a generic roadmap to the implementation of innovative bioassays in the water sector and address existing barriers for implementation.

VEOLIA is the global leader in optimized resource management. The company designs and provides water, waste and energy management solutions that contribute worldwide to the sustainable development of communities and industries. Through its three complementary business activities, Veolia helps to develop access to resources, preserve available resources, and to replenish them. A network of researchers spurring innovation – VEOLIA Recherche & Innovation (VERI), created in 2007, carries out the company's research in its three fields of activity (water, waste management and energy). The VERI research programs aim to enhance the quality of Veolia's services while at the same time lowering their cost, and to seek solutions that match our determination to work towards sustainable environment management and protection of human health.

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DEMEAU

EFFECT-BASED MONITORING TECHNIQUES

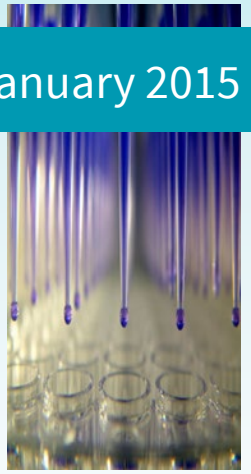
"*In-vitro* Bioassays as innovative tools for water quality assessment"

ENDETEC VEOLIA

WORKSHOP EVENT

Centre d'Analyses Environnementales

1 place de Turenne
94417 Saint Maurice Cedex
Paris, France



29th January 2015

VEOLIA
KWR Watercycle Research Institute
oekotoxzentrum centre ecotox
BDS BioDetection Systems
waterOnet
Griffith UNIVERSITY Queensland, Australia

SPEAKERS

- **Dr. Kirsten Baken** is a European Registered Toxicologist and project manager at KWR Watercycle Research Institute. She is involved in various research projects and coordinating projects that deal with water quality issues and the application of bioassays.
- **Dr. Armelle Hebert** is an environmental health risk assessment expert in the Department Environment & Health of Veolia Recherche & Innovation (VERI). She is involved in European research projects that aim to anticipate potential effects on public health related to long-term exposure to chemical contaminants and their mixtures in drinking water (as DBPs, endocrine disruptors, pharmaceutical products and priority pollutants).
- **Dr. Cornelia Kienle** is aquatic ecotoxicologist at the Swiss Centre for Applied Ecotoxicology (Ecotox Centre) Eawag-EPFL. She is currently completing post-graduate studies as SETAC "Fachökotoxikologin". Her work focuses on aquatic ecotoxicological bioassays and their application for water quality monitoring.
- **Dr. Merijn Schriks** is a European Registered Toxicologist at KWR Watercycle Research Institute. He is involved in various research projects and coordinating projects that deal with water quality issues and the application of bioassays.
- **Dr. Eszter Simon** coordinates projects at BioDetection System (BDS) on effect-based bioanalytical tools to be used in water quality monitoring. Her work focuses on performance/development/validation of reporter assays (CALUX technology), toxicity screening of feed/food, human and environmental samples and risk assessment of a broad range of toxicants, which are key- expertise of BDS.
- **Dr. Harrie Besselink** is the Director of Product and Application Unit at BioDetection Systems (BDS). He has ample experience in assessing dioxin- and hormone-like activities in food, feed, environmental and clinical/pharmaceutical samples using biological analysis techniques (CALUX technology) and in the area of bioassay validation, epidemiology and water quality monitoring.
- **Dr. Ron van der Oost** is a European Registered Toxicologist, Working at the Waternet Institute for the Urban Water Cycle. The main goal of his work today is bridging the gaps between scientific knowledge and practical applications of bioassays for environmental and human health monitoring.

TECHNICAL SUPPORT

Dr. Charlotte Arnal (VERI), Emiel Felzel (BDS), Andrea Schifferli (Ecotox Centre).

ABOUT THE VENUE

For over 10 years, the Center for Environmental Analysis of Veolia accompanies collectivizes, industrial and tertiary companies in the daily management of the safety and quality of environmental monitoring. It provides a comprehensive and global service of sampling and analysis to simplify the monitoring of facilities in order to be always more reactive in context of crises management. Laboratory network close to its customers with seven laboratories located in France, ENDETEC can meet the requirements of responsiveness, quality and timeliness.

EFFECT-BASED MONITORING TECHNIQUES

"In vitro Bioassays as innovative tools for water quality assessment"

29 January 2015, Paris, France

08:30–09:00 Registration / Coffee

Morning	Introductive Scientific program
9:00–9:10	**Welcome and introduction** Dr. Armelle Hebert, VERI, and Florence Poty, ENDETEC, France
9:10–9:35	**What are bioassays and how do they work?** Dr. C. Kienle, Ecotox Centre Eawag-EPFL
9:35–10:00	**In vitro bioassays for human toxicological effect assessment** Dr. A. Hebert, VERI, France
10:00–10:25	**Application of in vitro bioassays for water quality monitoring** Dr. H. Besselink, BDS, The Netherlands
10:25–10:50	**Interpretation of bioassay results** Dr. R. van der Oost, Waternet, The Netherlands | Dr. M. Schriks, KWR, The Netherlands
10:50–11:20	Coffee break
11:20–12:20	**Case studies – Bioassays' added value in water quality monitoring** • Do priority compounds account for water pollution? Toxicity screening of the WFD compounds (Dr. E. Simon, BDS, The Netherlands) • Novel toxic endpoints in water quality monitoring: oxidative stress and glucocorticoid activities (Dr. M. Schriks, KWR, The Netherlands) • Genotoxicity, mutagenicity and oxidative stress in water bodies (Dr. K. Baken, KWR, The Netherlands) • Wastewater and surface water quality assessment (Dr. C. Kienle, Ecotox Centre Eawag-EPFL, Switzerland)
12:20–12:30	**Wrap up**
12:30–13:15	**Lunch**

Afternoon	Bioassay lab demonstration – practical session in 3 groups
13.30–14.30	Group A: Sample workup prior to bioassays and data handling Group B: Bioassay type 1 (Microtox assay) Group C: Bioassay type 2 (CALUX assay as example of reporter gene assay)
14:30–15:30	Group A: Bioassay type 1 (Microtox assay) Group B: Bioassay type 2 (CALUX assay) Group C: Sample workup prior to bioassays and data handling
15:30–16:00	Coffee break
16:00–17:00	Group A: Bioassay type 2 (CALUX assay) Group B: Sample workup prior to bioassays and data handling Group C: Bioassay type 1 (Microtox assay)
17:00–17:15	Closure