

## EDITORIAL

The occurrence of microplastic particles has been spotlighted by numerous media in recent times – quite rightly since all sizes of plastic particles ubiquitously infiltrate and pollute the aquatic environment. Great ocean garbage patches have accumulated which consist to 80 % of bags, cans and PET bottles. Tiny particles, invisible to the naked eye, find their way from laundry wastewater to the sewer system every time fleece clothing is run through our washing machine.

The enormous quantities of plastic garbage retained day by day by the screening units of sewage plants clearly demonstrate that domestic water is indeed an entry path for plastic material. The screening technology however, is not designed to retain microplastic particles so that these elements are finally discharged into the surface waters.

Financed by the Federal Ministry of Education and Research (BMBF) KWB has started investigations relating to the filtration of microplastic particles from real WWTP effluents in cooperation with Berlin's water utility Berliner Wasserbetriebe and Technische Universität Berlin, the latter being the coordinator of the project. This project analyses various filter schemes of different producers in terms of their retention capacity for microplastic particles.

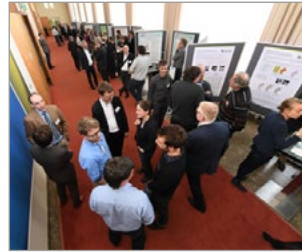
The sources contributing to microplastic pollution of the aquatic environment have not been detected in detail. Most likely there also other plastic sources in urban areas besides the wastewater path. Against this background, KWB will identify the sources of microplastic entry and quantify them by a material-flow-model in Berlin's wastewater path.

It is impossible to find one single solution to all entry sources. KWB will do its bit to find the suitable answers.

This is only one of several topics we are dealing with. Our newsletter provides you with a short insight into our recent activities.

Edith Roßbach, Andreas Hartmann  
Kompetenzzentrum Wasser Berlin, Managing Directors

## LATEST NEWS



Photos © David Ausserhofer

### Sustainable Water Infrastructures

Final conference of BMBF funding programme  
INIS in Berlin



Since 2013, the INIS programme has funded the development of innovative and feasible solutions for adapting urban water management to current and future conditions. In mid-April all 13 collaborative projects presented their results at the programme's final conference on "Sustainable Water Infrastructures" in Berlin. The event was attended by 250 water professionals from industry and academia, politics and administration. During the two-day programme each collaborative project communicated its essential results. The exhibition forum featuring films, exhibits, brochures and posters was intensely used to deepen the critical dialogue between water professionals. The results of all projects are summarised in ten core messages addressed to decision makers in politics and industry.

→ [The Core messages of INIS \(Press release of BMBF, in German only\)](#)

→ [Summary of INIS Final Conference \(in German only\)](#)

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## KWB is participating in three new Joint Research Projects

*Material recovery from wastewater |  
Integrated wastewater treatment  
using natural and technical processes |  
Microplastic particles removal from  
wastewater*



Wastewater is a valuable resource. The options of recovering phosphorus from wastewater effluent for fertiliser development were subject to intensive research in the scope of previous projects. The focus of our recently launched projects has been broadened in terms of analysing further wastewater constituents such as biopolymers and cellulose. The collaborative project **SMART-Plant** will test existing technological approaches for resource recovery at an industrial scale to be performed at real WWTPs. The project has an overall budget of

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## NEWS FROM THE KWB NETWORK OFFICE

Along with the part privatisation of the Berliner Wasserbetriebe, Veolia had committed itself to contribute to the establishment of the non-profit Kompetenzzentrum Wasser Berlin through substantial financial support. Since its foundation in 2011, KWB has indeed evolved into an internationally renowned research centre for applied water research. Besides the financial contributions of its shareholders, KWB has attracted more than 50 million €

**Veolia will transfer its participation in Kompetenzzentrum Wasser Berlin (KWB) to the current shareholders Berliner Wasserbetriebe and Technologiestiftung Berlin.**

from national and international funding programmes. Veolia will now sell its stake in KWB in equal shares to the previous co-shareholders BWB/BWH and Technologiestiftung Berlin. The Land Berlin and Veolia have agreed upon a settlement stipulating a Veolia payment of 12.4 million € to the Land Berlin. This amount shall be used for

the fulfilment of KWB's remit in accordance with its articles of association. The Berlin parliament has approved both the settlement and sale agreement as well as the contract of assignment which were submitted by Cornelia Yzer, Senator for Economics, Technology and Research. ●

# NETWORKING FOR INNOVATIONS

INTERVIEW WITH DANIEL CRAWFORD, THE CEO OF MARTIN MEMBRANE SYSTEMS AG AND CHAIRMAN OF THE BERLIN ASSOCIATION VFW VEREIN ZUR FÖRDERUNG DES WASSERWESENS WHICH IS THE SUPPORTING ORGANISATION OF AQUANET, THE COOPERATION NETWORK FOR BERLIN'S WATER SECTOR. IN ADDITION, DANIEL CRAWFORD IS ALSO MEMBER OF THE SUPERVISORY BOARD OF KOMPETENZZENTRUM WASSER BERLIN. DANIEL CRAWFORD HAS GRADUATED IN ECONOMICS.



*You have been volunteering your time to manage the Berlin enterprises network AQUANET. What is it that drives you to be so committed? Being the CEO of MARTIN Membrane Systems is a full time job after all, isn't it?*

Dear Dr. Weigert, we have known each other for a long time, and time flies. But it's only one year ago that I took the position as chairman of the board of AQUANET. It is well known in our line that I love networking, and so it was just natural that I fell in love with AQUANET immediately. Of course my job with MARTIN Membrane Systems AG (MMS) requires much time and commitment, and I have got some other jobs, too. Honestly, I haven't watched TV for ages.

*AQUANET has been around for 4 years now. How does this network function? Can you mention some highlights of the recent years?*

What do you mean by highlights? Altogether, we are a number of small and medium enterprises with one single end in mind: to achieve sustainable cooperation. Our network runs on a level playing field, there is no individual company or board member playing a dominant role. We meet twice a month: one time with all members and one time with the board only. We swap ideas and exchange views and think about generating new joint projects. This works quite well. In addition, we have realised several successful events and seminars. A few weeks ago, we participated in the Berlin Corporate Run with 23 runners. This year

we will organise the AQUA-DAYS for the first time, which include the AQUA AWARD show and the AQUA ball.

*Within the water sector, the tempo of innovation cycles is less rapid than in other economic sectors. This is certainly due to the longevity of water infrastructure systems. How can the innovative capacity of water-related enterprises be strengthened against this background?*

In 2015, MARTIN Membrane Systems AG received the TOP 100 award which honours the superb work of MMS as one of the most innovative companies in Germany - a prize which we had been awarded for previous innovations also in 2009. Undoubtedly it takes us a little more effort to regularly deliver ground-breaking ideas which consider also sustainability aspects than the consumer goods industry for instance. So I am always happy if we succeed in doing so. This strategy consolidates the relationship to both our customers and our precious collaborators. We have been in the water treatment business for more than twenty years, our company has been constantly growing and of course we are very happy that the global market for water and wastewater technologies is steadily expanding. For this reason, our collaborators and all members of the network feel rather optimistic about the future. The intensive cooperation within the AQUANET network strengthens the innovation capacity of each individual member.

*AQUANET involves also several Chairs of the Technische Universität Berlin. What*

*about the network's strategy to generate new ideas and projects through the linkage of research and business goals?*

From my point of view, a solid relationship between SMEs and academia is indeed essential and stimulates cross-fertilisation of ideas. AQUANET is an excellent example for this approach. All members get together once a month and discuss new ideas in an informal atmosphere. Some of them click and a new project is created.

*The shareholder structure of KWB will change in the near term. What about the vision of AQUANET in terms of the future cooperation with KWB?*

AQUANET has developed an according policy document. To cut a long story short, in the first instance we would like to develop synergies, generate and implement joint projects. This is a sight better than to work concurrently and will give rise to a win-win situation. This is what I am working on.

*To round off this interview: May I ask you a personal question? Despite your family name which suggests an Anglo-Saxon background, you perfectly speak Franconian, a German dialect. Have you got any family relations to the English-speaking area?*

Of course you may ask me this question! My ancestors mainly lived in various parts of Southern Europe. But I have adopted my family name from my wonderful wife. She comes from the USA. ●

*Thank you very much for this interview. Bodo Weigert asked the questions*

# WATER RESEARCH IN BERLIN AND BRANDENBURG

Photo © KWB



## Water treatment – Synergies in combined natural and engineered processes (AquaNES)

*A wide range of complex challenges facing Europe's water utilities are dealing with growth in population, climate change or energy efficiency standards and require continuous adaptation measures.*

To this end, the AquaNES project which is funded by the EU Horizon2020 programme is supposed to deliver new results with regard to the benefits of combined natural and engineered processes. Field-scale tests will be carried out at 13 demonstration sites throughout Europe: Berlin, Erftverband, Dresden (DE); Budapest (HU); Poznan (PL); Harivar (IN); Shafdan (IL); Basel (CH), Agon Countainville (FR), Waddinxveen (NL), the islands Thirasia and Antiparos (GR). Bank filtration, managed aquifer recharge (MAR) and constructed wetlands are natural systems which will be combined with various technical pre- or post-treatment methods such as nano- and ultrafiltration, ozonation, activated carbon, UV- and chlorine disinfection.

The project consortium involves 30 partners from Europe, Israel and India. In Berlin, Berliner Wasserbetriebe, AKUT Umweltschutz Ingenieure as well as KWB participate in the project which is coordinated by the University of Applied Sciences and Arts Northwestern Switzerland.

The tasks to be performed in Berlin include the combination of ozonation processes with natural post-treatment steps for the elimination of trace organic compounds as well as the combination of bank filtration and nanofiltration for the removal of sulphate and trace organic compounds.

Besides these activities, KWB coordinates the work package demonstrating the suitability of constructed wetlands as an energy efficient post-treatment step for WWTP effluents and also for combined sewer overflows.

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Photo © Veolia

## Material recovery from wastewater (SMART-Plant)

*The demonstration project SMART-Plant will demonstrate current approaches for materials recovery techniques at an industrial scale at existing WWTPs. The aim is to recover as many materials as possible from the wastewater path and to recycle them into commercially usable end products.*

SMART-Plant will assist the European water sector with the development of advanced and green solutions to water reuse issues and the recycling of useful materials from wastewater. The focus of the project is on the recovery of biopolymers, cellulose, phosphorus and biogas. The recycled products can be used for fertiliser production, soil enrichment, conditioning of sewage sludge and the production of biodegradable synthetics. The large scale investigations are performed at 6 WWTP sites throughout Europe (Groningen, Netherlands; Cranfield, UK; Karmiel, Israel; Manresa, Spain; Psyttalia, Greece; Carbonera, Italy). A market study and the development of new operating schemes will consolidate the partnership between the wastewater sector and the chemical industries. KWB will demonstrate the feasibility of recycling different materials originating from domestic wastewater and assess the environmental and economic benefits by LCA. The project which was launched in June 2016 involves 25 partners and is coordinated by the University of Verona (Italy). Its overall budget amounts to € 9.7 million.

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## Microplastic particles removal from the water cycle (OEMP)

*Microplastics are small synthetic particles which can be detected in nearly all environmental media and various biota and have entered the food chain of aquatic organisms.*

The project "Optimised materials and methods for microplastic particle removal from the water cycle" (OEMP) is funded by the German Federal Ministry of Education and Research (BMBF) and managed by the Technische Universität of Berlin. It is dedicated to developing materials and methods which will help to retain the entry of microplastic particles (MP) emerging from diverse pathways of the urban water cycle. Different versions of fabric filters and also simple and natural systems such as soil filters will be analysed with regard to their retention efficiency. In order to validate the retention degrees, KWB will carry out pilot tests at a Berlin WWTP under real conditions. The aim is to determine the best operating conditions on a pilot scale. Besides the retention of MP also general wastewater-related chemical parameters such as suspended solids or turbidity are specified in order to identify possible correlations allowing for an operational control without expensive analytics. On the basis of existing and new measurements, KWB will develop a model illustrating the material flow of MP in Berlin's wastewater path. The project will be running for two years.

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Bundesministerium  
für Bildung  
und Forschung



Horizon 2020  
European Union Funding  
for Research & Innovation

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€ 9.7 million and will be financed for 4 years by the EU Horizon2020 programme. *More info on page 3*

The **AquaNES** project will demonstrate the benefits of combined natural and technical wastewater treatment methods under real conditions at 13 test sites, two of them situated in Berlin. This project has a total budget of € 10.7 million and will be financed for three years by the EU Horizon2020 programme. *More info on page 3*

In the scope of the **OEMP** project, materials and processes facilitating the retention of microplastic particles (MP) from different urban wastewater effluents will be developed. By means of pilot tests to be performed with real wastewater, KWB will validate different suitable techniques. The project will be funded for two years by the Federal Ministry of Education and Research (BMBF) and has an overall budget of € 1.4 million. *More info on page 3* ●

## FOCUS

**Parameters for using treated wastewater for agricultural irrigation in an ecologically responsible way** → [Download](#)



*Authors: Wolfgang Seis, Boris Lesjean (Kompetenzzentrum Wasser Berlin), Sebastian Maaßen, Dagmar Balla (Leibniz Centre for Agricultural Landscape Research - ZALF), Rita Hochstrat (University of Applied Sciences and Arts Northwestern Switzerland), Bernhard Düppenbecker (TU Darmstadt)*

*Published by German Federal Environment Agency, Reihe Texte| 34/2016, April 2016 (in German)*

The report addresses the parameters for the use of treated wastewater for agricultural irrigation in Germany. It summarises different aspects which have to be considered when realising and assessing irrigation measures with treated wastewater. The report gives an overview on the status quo of agricultural irrigation practices in Germany, the infrastructural requirements and analyses of the potential and the actual demand for agricultural water reuse. Possible risks of the irrigation relating to the hygienic and chemical quality of treated municipal wastewater are identified and assessed, if possible, on the basis of existing protection requirements for surface waters, soil and human health. With regard to the quality requirements of wastewater, different national and international irrigation and water reuse standards are compiled. ●

## EVENTS

**Meet us at the following upcoming events:**

20-24 June 2016

**9<sup>th</sup> International Symposium on Managed Aquifer Recharge ISMAR9**

Venue: Mexico City

→ [www.ismar9.org](http://www.ismar9.org)

27-30 June 2016

**The R User Conference UserR**

Venue: Stanford University California

→ [user2016.org](http://user2016.org)

27-30 June 2016

**3<sup>rd</sup> IWA Specialized International Conference "Ecotechnologies for Wastewater Treatment" (ecoSTP2016)**

Organiser: IWA | Venue: Cambridge, UK

→ [www.ecostp2016.com](http://www.ecostp2016.com)

28 June – 1 July 2016

**9<sup>th</sup> International NOVATECH Conference 2016**

Organiser: GRAIE

Venue: Lyon, France

→ [www.novatech.graie.org/a\\_index.php](http://www.novatech.graie.org/a_index.php)

10-14 July 2016

**Singapore International Water Week**

Organiser: PUB

Venue: Singapore

→ [www.siww.com.sg](http://www.siww.com.sg)

25 August 2016

**NWZ Abwasserdialog**

Organiser: Norddeutsches Wasserzentrum

Venue: Brunswick, Germany

→ [www.n-w-z.de/veranstaltung/3-nwz-abwasserdialog](http://www.n-w-z.de/veranstaltung/3-nwz-abwasserdialog)

31 August – 2 September 2016

**8<sup>th</sup> International Conference on Sewer Processes & Network**

Organiser: Sewer Systems & Processes

Working Group of the IWA-IAHR

Venue: Rotterdam, The Netherlands

→ [www.spn8.nl](http://www.spn8.nl)

31 August 2016

**31. Berliner Summer-School – The future of the City (in German)**

Organiser: Berliner Akademie für weiterbildende Studien

Venue: TU Berlin

→ [berlinakademie.de](http://berlinakademie.de)

4-9 September 2016

**IWA Specialist Conference on Wetland Systems for Water Pollution Control**

Organiser: IWA

Venue: Gdansk, Poland

→ [icws2016.org/welcome](http://icws2016.org/welcome)

7-8 September 2016

**Kanalgipfel Frankfurt**

Veranstalter: Ingenieurgesellschaft Prof. Dr.-Ing. Stein & Partner GmbH und THIS – Das Fachmagazin für erfolgreiches Bauen  
Venue: Frankfurt, Germany

→ [www.kanalgipfel.de](http://www.kanalgipfel.de)

12-16 September 2016

**8<sup>th</sup> International Phosphorus Workshop (IPW8)**

Organiser: Leibniz ScienceCampus

Phosphorus Research Rostock

Venue: Rostock, Germany

→ [www.sciencecampus-rostock.de/ipw8-home.html](http://www.sciencecampus-rostock.de/ipw8-home.html)

13 September 2016

**Berliner Sanierungstage**

Organisers: GSTT e.V., Berliner Wasserbetriebe

Venue: Berlin, Germany

→ [www.berliner-sanierungstage.de](http://www.berliner-sanierungstage.de)

26-27 September 2016

**Aqua Urbanica**

Venue: Zurich, Switzerland

→ [www.aqua-urbanica.org](http://www.aqua-urbanica.org)



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Our annual report in the web.

→ [Download](#)

## about us

The Berlin Centre of Competence for Water (Kompetenzzentrum Wasser Berlin, KWB) is a public-private partnership company. Its associates are the Technologiestiftung Berlin, the Berliner Wasserbetriebe, the Berlinwasser Holding and Veolia. Through its network activities, the KWB strengthens Berlin's position as an international centre in the field of water economy and technology. Partners and actors are scientific facilities, public institutions, companies as well as multipliers from public and private sectors.

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