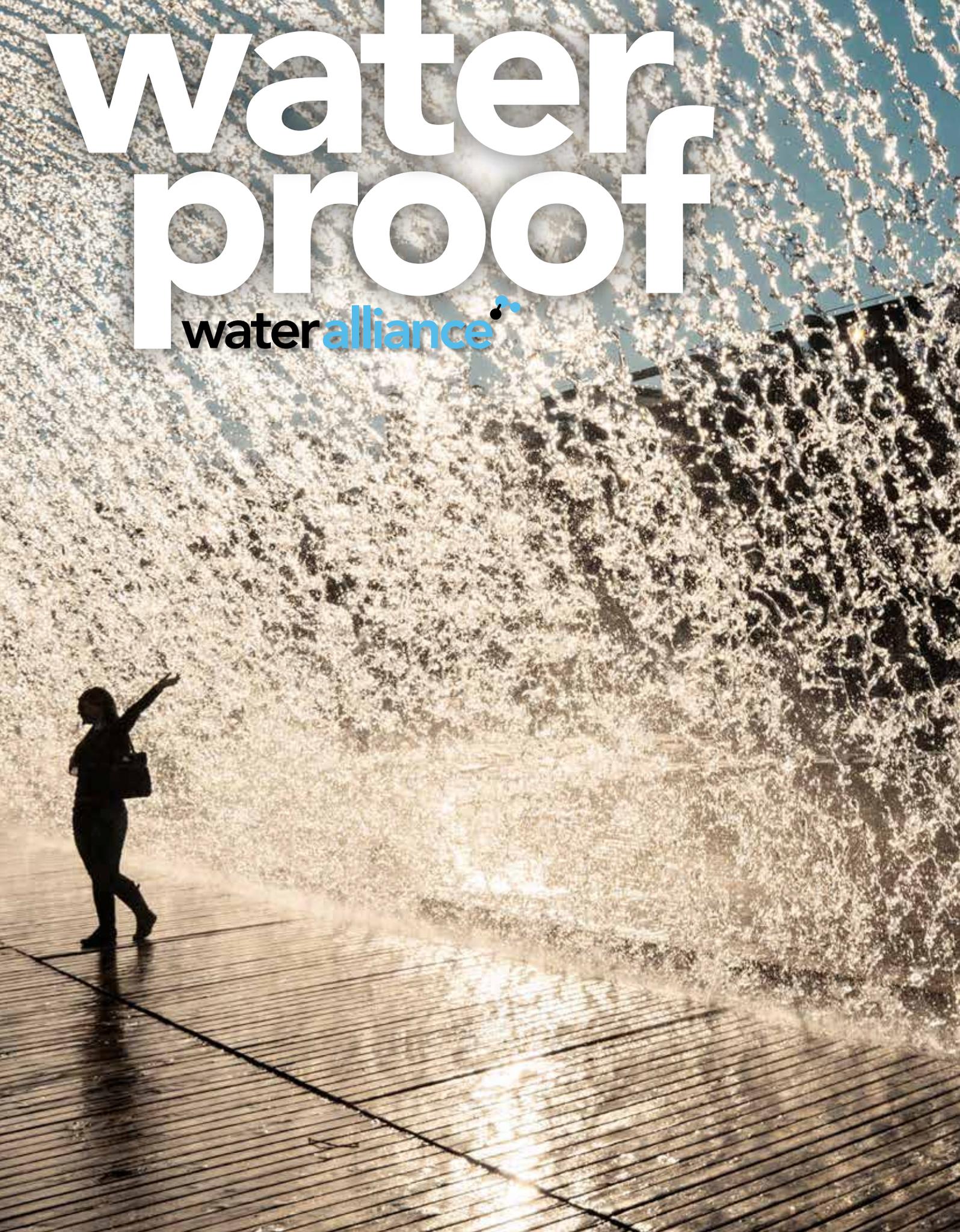


# waterproof

wateralliance



NUMBER 01, 2018

**INNOVATION  
AVENUE STEALS  
THE SHOW**

**FORU SOLUTION'S  
FLOATING OIL  
RECOVERY UNIT**

**EUROPEAN  
WATER TECH  
WEEK 2018**

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**EUROPEAN WATER TECH WEEK 2018**  
CONNECTING GLOBAL WATER TECH HUBS

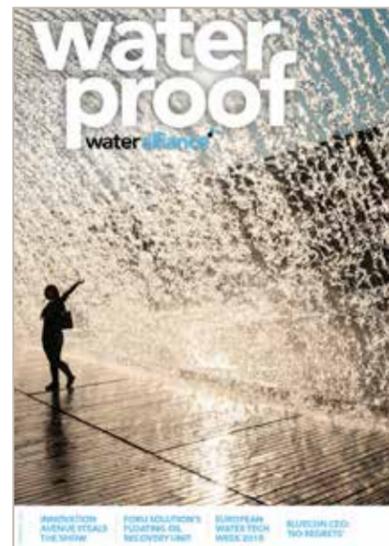


**BLUECON**  
"OUR PROCESS IS 100% PHYSICAL"

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COLOFON

WaterProof is the magazine of the Water Alliance, a partnership between government, research institutions and industry in the field of innovative and sustainable water technology. From its base, the WaterCampus in Leeuwarden, the Water Alliance builds on the 'water technology innovation chain'; a process whereby new ideas from universities, laboratories and test sites are converted into worldwide marketable products. WaterProof provides regional, national and global information on developments, results and background in the field of water technology.



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INTRO by Hein Molenkamp

# ACCELERATION

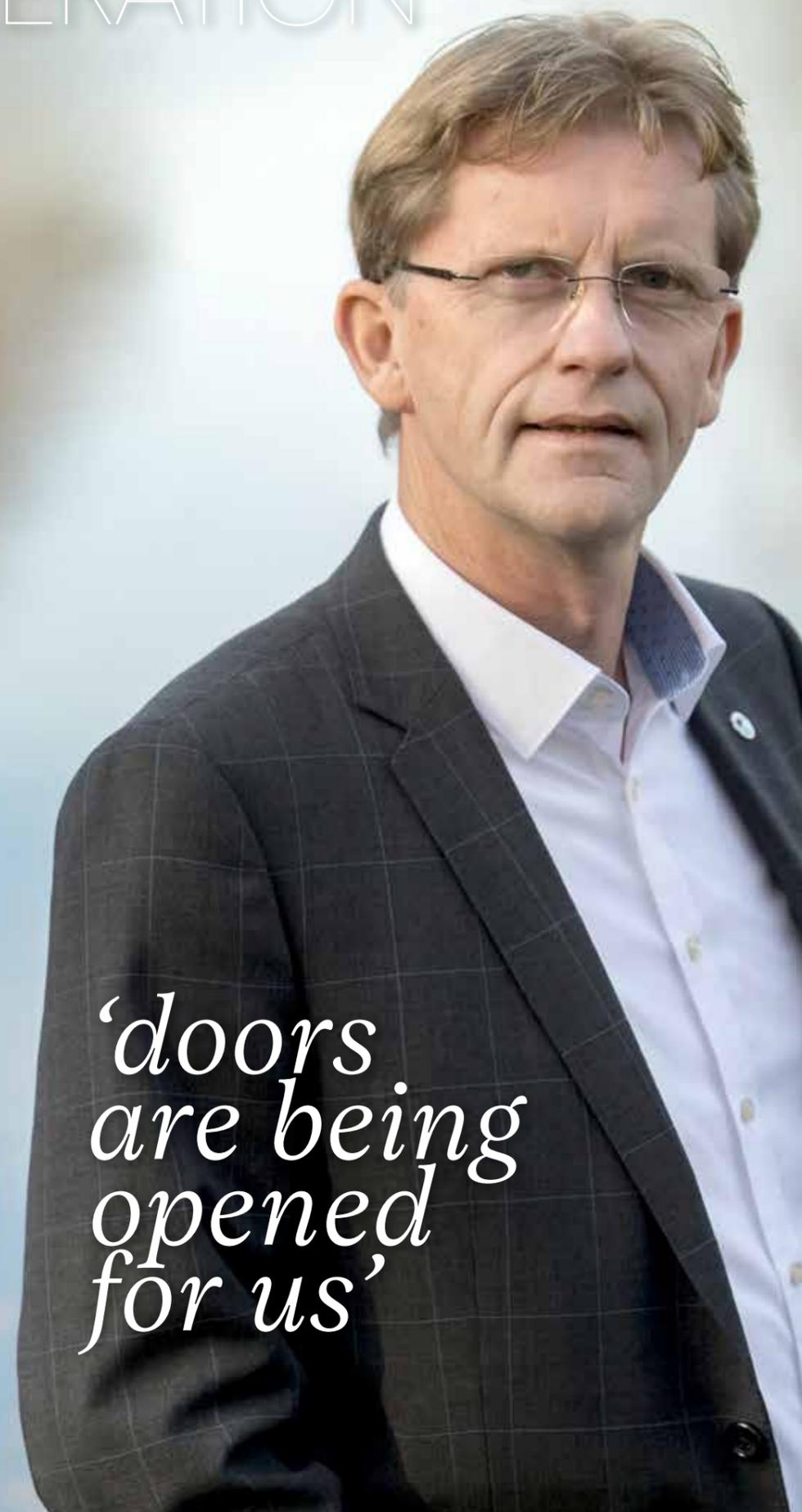
It is quite something; practically every week something happens in the dynamic environment of the Water Alliance that we would love to be able to include in this magazine. Yet, sometimes an issue is simply already at the design studio or even at print. That is why we always leave my foreword till last. It allows me to share any last minute news, thoughts, or convictions with you.

One such conviction is that in 2018, we will experience a year of acceleration. Firstly, because we are noticing a worldwide increase in interest now that we have established the WaterCampus Leeuwarden so strongly with our partners. Doors we could not have dreamed of opening three years ago are being opened for us. Secondly, because we want to go further. Our hometown of Leeuwarden, along with the rest of the region, is the cultural capital of Europe in 2018. That is why we are inviting anyone involved in water technology to attend the European Water Tech Week Leeuwarden (EWTW2018) from 24 to 27 September. Besides it being a great place to discover the latest innovations and learn about everything and everyone involved in the WaterCampus, you will have the opportunity to meet other international water hubs in attendance, from the USA to Asia. You can read more about this further on in this magazine.

In the meantime, we have also continued matchmaking. For example, the Water Alliance and several members visited the International Water Summit (IWS) in Abu Dhabi from 15 to 18 January. Witteveen + Bos and Hydraloop both won awards for their innovations, and subsequently became very busy. "The response here in Abu Dhabi is overwhelming. I have talked to so many people since winning the award", says Sabine Stuiver, Director of Sales & Marketing at Hydraloop. The publicity value of winning an award can be huge. And while we are on the topic: do you own a Dutch company and have a great innovation? Then, I challenge you. Enter our innovation competition, the WIS Award 2018; the final will be during the EWTW2018. The prize is an entire year of marketing support valued at €10,000, which can give your company a massive boost. I wish you all a year of acceleration in 2018! Oh, and before I forget, I am also extremely proud to have been selected as one of the Top 25 Global Water Leaders of 2018 by WaterWorld. It is a wonderful accolade which will fuel further acceleration at WaterCampus.

Hein Molenkamp  
Managing Director, Water Alliance

*'doors are being opened for us'*



## Water at School



We at Waterproof love trivia. For example, research shows that 38 percent of children at Dutch schools would like to drink more water at school. That was the conclusion of a study commissioned by research bureau Kantar Public on behalf of water company Vitens in its supply area. Parents also take the importance of water seriously, the study shows. A total of 28 percent believe that drinking water at school should be made mandatory.

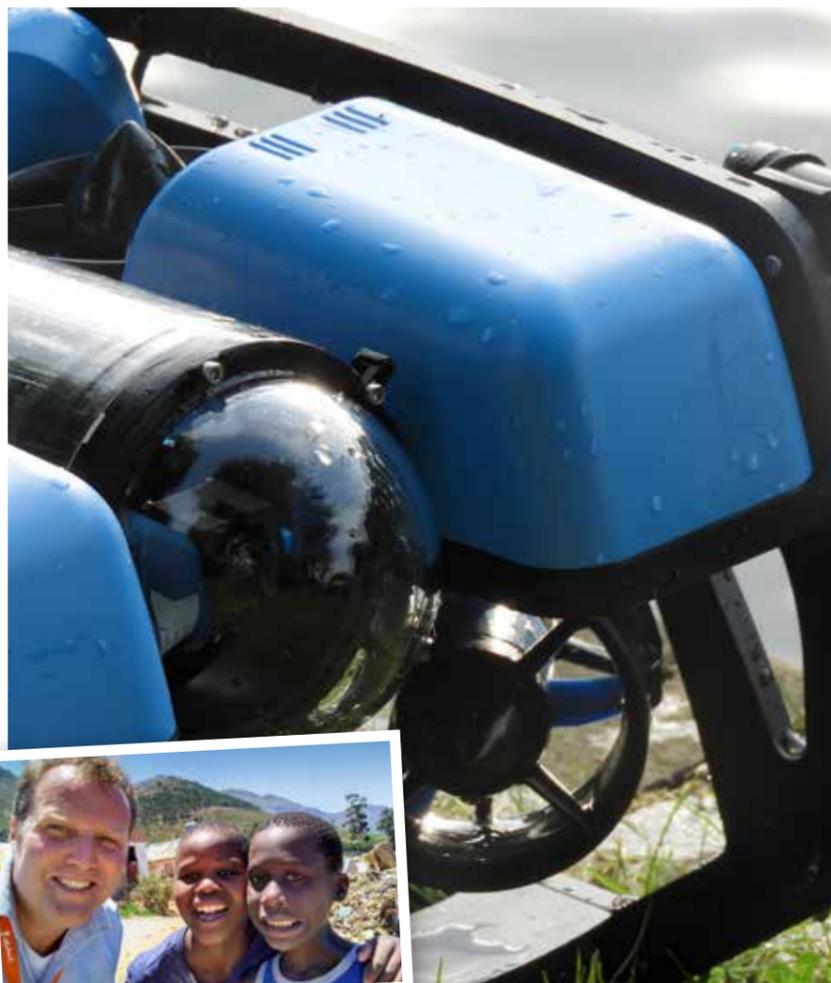
## Innovative mixing unit by ATB Nederland is sustainable and economical

A sustainable future grows closer every day. Take Water Alliance member ATB Nederland, for example. In conjunction with various water authorities, ATB has subjected the Alltech EMMI 6000 Dynamic Mixing Unit to extensive tests. For those who do not yet understand, this new product uses innovative techniques to create the optimal blend of polymer concentrate and diluent water. This allows the same or an even better final result using less polymer concentrate. During testing, a forty percent saving on polymer concentrate was ultimately achieved. The tests were conducted using both Alltech and other polymer systems. Aside from the obvious financial reasons, the saving is great news for sustainable business.

[atbnederland.nl](http://atbnederland.nl)



# DUTCH UNDERWATER DRONES ACTIVE IN AFRICA



Water Alliance member INDYMO is currently researching water quality and ecology in Mali and South Africa. In Mali, underwater drones (a.k.a. 'aquabots', ed.) are used to measure water quality using sensors and cameras. INDYMO is at an advanced stage in its preparations to conduct these measurements in Durban, Cape Town, and Pretoria as well.

"We want to gain detailed insight into the water quality there", says co-founder Floris Boogaard. "We also want to find out what the most influential sources of pollution are, so that it can be stopped. Our aim is to introduce new measurement techniques in Africa, which can be developed further with partners in order to cost-effectively deal with polluted rivers."

The study in Mali is being conducted in cooperation

with ABFN (lead), Akvo (tool provider), and CNU (data collection); INDYMO's role involves supplying the drones, teaching courses, and taking measurements in the Niger River. The study in South Africa is being set up in cooperation with the Dutch water authorities and two companies, AquaSmartxl and RanMarine. This partnership was established after an economic mission to South Africa by the Ministry of Foreign Affairs in 2017. The mission presented a good opportunity for Dutch companies and knowledge institutes to explore the South African market and launch new projects together with local businesses and public parties.

### Editor's note:

More on INDYMO in the next issue of Waterproof.

# FINDING THE CAUSES OF STAGNATING WATER QUALITY TOGETHER

After a period of systematic improvement in water quality, the concentration of nitrogen and phosphate in surface water has hardly decreased at all in the past ten years, despite all the measures introduced during that period. Fertilization standards, for instance, have been made more stringent and wastewater purification has significantly improved. Wetterskip Fryslân (a waterboard in the Netherlands, ed.) and Stichting Mesdag Zuivelfonds (a foundation for the improvement of the quality of milk, ed.) have therefore contracted research institute NMI from Wageningen to better identify the sources of pollution. They expect to have the first results by spring this year.

Last year, Stichting Mesdag Zuivelfonds put the 'stagnating water quality' on the House of Representative's agenda. According to research

journalist Geesje Rotgers, not all sources of pollution are well defined. Examples of this include the nutrient supply from natural seeps, sewer overflows, and waterfowl. The agricultural sector therefore believes that agriculture is too unilaterally seen as a source of nutrients. The partners have not always agreed on everything in the past, but Marian Jager, a member of Wetterskip Fryslân's executive board, says: "We will now be looking at the bigger picture of this water issue together. We hope to clarify the agricultural sector's role in water quality, as well as what can and should be expected of it."

**Photo:** Marian Jager, member of Wetterskip Fryslân's executive board and Lubbert van Dellen, secretary of Stichting Mesdag Zuivelfonds, take a water sample to formalize the partnership.



Photo: Daniël Hartog.

## Hein Molenkamp in 'Top 25 Global Water Leaders'

Hein Molenkamp, director of the Water Alliance, has made it onto the 'Top 25 Global Water Leaders' list by Water & Wastewater International (WWI). Molenkamp entered the list at a commendable 12th place.

WWI is an international multi-channel portal for the water technology sector. It is a subsidiary of media mogul PennWell Corporation, headquartered in Tulsa, Oklahoma (USA). WWI publishes an annual list of the 25 most influential water managers. In 2017, they focused on people whose proactive attitude helps innovative companies succeed. First place was awarded to Carlos Cosin, CEO of Almar Water Solutions, a Spanish water technology company with various international branches.

For more information, please see: [www.waterworld.com/artides](http://www.waterworld.com/artides)

## Dutch companies win awards in Abu Dhabi

Hydraloop International and engineering firm Witteen+Bos won awards at the International Water Summit (IWS) in Abu Dhabi. Hydraloop, which has a branch at the WaterCampus Leeuwarden, developed a water recycling system which collects, cleans, and disinfects water from bathrooms and washing machines. By reusing 55 percent of tap water, the system results in considerable savings. Developed by Witteveen+Bos, the 1-STEP filter is a compact, modular carbon filter which combines four treatment processes into a single treatment unit. Dutch companies exhibited their projects and innovations in the Smart Water Pavilion at the IWS, which was held in January. Water Alliance was actively involved with the pavilion.



## EnW partner CLEAN: successful in China

Water Alliance works with six other cluster organizations from various European countries in the collaborative project Energy in Water (EnW). The goal of the project is to strengthen the growth and valorization of SMEs in the water and energy sectors. CLEAN, from Denmark, is one of the partners. In addition to the Danish market, the organization is also active in the Chinese market, where it creates commercial solutions for water, groundwater, and the climate. According to CLEAN, the Chinese market offers countless opportunities for water-related SMEs. CLEAN works closely together with the Chinese consultancy firm Umore. Umore matches the right cleantech solutions from foreign SMEs with Chinese partners. The company supports the SMEs in terms of marketing, and stimulates the market growth. Both organizations signed the official International Cooperation Agreement (ICA) in November. The cooperation is a great next step towards supporting SMEs in their search for the right Chinese partner.



*“Water is patient. Dripping water wears away a stone. Remember that, my child. Remember you are half water. If you can’t go through an obstacle, go around it. Water does.”*

Margaret Atwood, The Penelopiad

# WATER TECHNOLOGY SEIZES OPPORTUNITIES IN HEALTHCARE



We are using an increasing amount of medicine in the Netherlands. Too often, pharmaceutical residue ends up in the sewer system and then in the water. That is harmful to aquatic life and creates problems in the preparation of clean drinking water. The problem, along with possible solutions, was the focus of attention during the Water & Health symposium held on 19 October in the Medisch Centrum Leeuwarden (Medical Centre Leeuwarden, MCL) and the WaterCampus Leeuwarden. Those in attendance also learned that pharmaceutical residue is not the only problem for hospitals. There are many more challenges. Those challenges are opportunities for water technology companies.

During the symposium - which was organized by Water Alliance, the European Water Stewardship (EWS, located on the WaterCampus Leeuwarden), and the MCS- it was explained that this is what is known as a ‘wicked problem’. There is even debate on whether pharmaceutical residue should already be removed in hospital wastewater systems, or if the solution should be sought more centrally, at the wastewater

treatment plant. After all, nearly ninety percent of pharmaceutical residue enters the sewer system through households.

### Solutions

Reducing pharmaceutical residue in wastewater is certainly not the only challenge the healthcare industry faces. Topics such as the necessity of additional purified water, disinfection, water-saving measures, and the desire to use fewer chemicals offered sufficient leads for Water Alliance to have a dozen companies pitch their ideas during an afternoon programme. Technologies including activated charcoal, ozone, membrane filtration, copper/silver disinfection, mechanical vortex, UV shower heads, and autonomous microbiological analyses were discussed during the packed programme. “The great thing about an afternoon like that is that people actually meet each other”, says Alex Berhite, involved on behalf of the Water Alliance. “You hear more, you learn more. In direct conversation with the MCL, companies made the translation to applications. This will definitely result in an abundance of solutions in the coming years.”

# NO WATER, NO BEER



At the Aquatech exposition in Amsterdam in late October and early November last year, visitors were treated to a pleasant surprise in the Netherlands Water Pavilion on 3 November: free beer. Not just any beer, though; all the beers on offer had a curious story. For example, what does beer made with rainwater from Amsterdam taste like? What about beer made with water extracted from the milk of the world-renowned Frisian cow?

The overwhelmingly large audience was able to sample three types of beer during the tasting. To allow voting, the samples were served in cups without labels. The ‘Zuivelbier’ (Dairy Beer), developed by food technologist and amateur brewer Thomas Roersma -who works for Wafilin Systems in Leeuwarden- may have the most extraordinary story. Their beer is made using water extracted from cow’s milk. “That makes it extra safe, as well as sustainable”, says Wafilin founder Harry Van Dalen. “The cow has already filtered the water, so to speak, and Wafilin Systems’

membrane filtration does the rest”, adds Roersma. “We then made it into a wheat beer.” The beer from Nijhuis Industries was also particularly tasty. They demonstrated that even wastewater can be purified to the point that it is suitable for brewing beer.

Last, but not least, was Rain Beer (formerly known as Hemelswater, Dutch for Heaven’s Water). The name is just as accurate as Zuivelbier, as Rain Beer is made of: rainwater from Amsterdam. Mijn Waterfabriek (Hardenberg, the Netherlands) and PB International (Zelhem, the Netherlands) supplied the systems which filter the rainwater. “It’s a really great cooperation”, says Arran Kassens from PB International. “Everyone has their own area of expertise. They collect the rainwater, we make sure it is properly filtered, and they then turn it into a great-tasting beer.” After the final count, Rain Beer proved to be the most popular of the three beers.

# IDENTIFYING SENSORS WITH DIGITAL PLATFORM

The sheer number of measurement instruments and sensors for monitoring water quality online is staggering. Approximately ten new sensor suppliers join their ranks every year, and the number of new sensor technologies is growing exponentially. As a result, finding the right sensor for a specific monitoring process is becoming increasingly difficult. Sensileau, the new digital platform by entrepreneurs Corina Carpentier and Jan Broos (also involved with Bente Water Solutions) offers a solution, delivering concise, extensive knowledge and technical information on virtually all commercially available online sensor technologies world wide. “The user can quickly and easily search for the right

sensor for any monitoring process using our handy search feature”, says Broos. “User experiences on the platform prove that the use of the right sensor, combined with improved sensor- data analysis methods, leads to cost savings and process optimization, such as reductions in energy and chemical use, as well as reductions in leakage losses. Sensileau also provides insight into the purchase costs and operational costs, as well as support for sensor installation, maintenance, and calibration.”

**Editor’s note:** Sensileau is a member of the Water Alliance. Visit [www.sensileau.info](http://www.sensileau.info) for a demo.

## Speed dating for water solutions

On Friday 20 October, at WaterCampus Leeuwarden, Wetsus hosted the ‘Brain Hurricane’, part of the international event Wetskills. As part of the Amsterdam International Water Week (AIWW), a total of 23 water technology students came to the Netherlands from 19 October through 2 November 2017 to spend a week working on problems presented by actual market players, including water authorities and water companies. Part of that was Brain Hurricane Leeuwarden, which saw teams try to come up with original solutions under the direction of experts from the field. The winners of the final, which was held in Amsterdam ten days later, were Dutch participants Thijs Lieveise and Jelle Dijkema, together with Asandiso (South Africa), and Radwa Elzeiny (Egypt). The winning team devised a new fish migration system for the Amsterdam water company Waternet. The prize was awarded by Nomvula Mokonyane, the South African Minister of Water and Sanitation.



*“High and fine literature is wine, and mine is only water; but everybody likes water.”*

Mark Twain

# aa

## is for avenue

Innovation Avenue  
steals the show during  
Aquatech Amsterdam

*It was an all-out hit; Water Alliance's idea for an 'Innovation Avenue' to display a whole range of water-related Dutch innovations, at Aquatech, which was held in Amsterdam from 31 October through 3 November. 'Innovation Avenue' was in effect a long street where a multitude of innovations in the water technology field were presented. WaterProof spoke with some of the people involved.*

The Leeuwarden-based company Acquaint was of course in attendance, represented by businessman Rudy Dijkstra, who was presenting Acquarius, the inspection robot for use by water companies and others to evaluate the condition of their pipelines. And that in-line, because the Acquarius is a wireless system that uses sensor technology, so it can inspect pipelines over their entire length. The inspection robot detects corrosion, angular distortions, deformations and leakages. "Aquatech was very worthwhile for us", said Dijkstra. "For instance, while we were here we made contact with a large company from China. They have a lot of difficulty with leakages in their systems there. Naturally they were very interested in solutions. In February we are going to visit China at that partner's invitation."

### Revolutionary

Metalmembranes, co-founded by entrepreneur Sybrand Metz presented a new technology: 'photocatalytic membranes'. "We're talking about a ceramic filter with extremely fine pores that are cleaned by light", Metz explained. "That way, fouled water is filtered in an extremely precise way. Therefore, bacteria, viruses, but also for example, medicine residues, can be filtered out of water. At the same time we apply light. That way, the substances retained by the filter are converted into CO2 and water. And also, of course, the filter stays a lot cleaner that way. A major benefit is that much larger quantities of clean water pass through the filters, no chemicals are needed to clean the filter and no maintenance is required. That end product is extremely clean water, with the mineral content still intact."

The invention could prove revolutionary in a variety of industries, including water companies but also hospitals, as Metz is well aware. Metalmembranes is collaborating with Wetsus to better understand and improve the technology. "It really is shaping up to be a great invention, but we are still at the start of the process. Right now we're working hard to find launching customers where we can demonstrate that far more clean water can be produced using our light treatment."



Sybrand Metz

### Hugs

WaterCampus Leeuwarden was prominently represented on Innovation Avenue too. The participating partners Wetsus, Water Alliance, the Water Application Centre (WAC), the Centre for Innovative Craftsmanship Water (CIV) and the Centre of Expertise Water Technology (CEW) had no fear of being eclipsed by the marketing tour de force of a collaborative representation, as Länk Vaessen of CEW explained. "Having an individual presence here is completely unnecessary. We all sell solutions together. Ideas, knowledge, facilities. That is quite unique in the world. Yesterday I spoke with a trade show visitor from Israel. 'I just want to hug you', he said. 'This is exactly what we've been looking for!'"



Länk Vaessen

For all of those interested in getting better acquainted with the WaterCampus and the various centres of expertise, facilities and businesses: the city of Leeuwarden will be the Cultural Capital of Europe in 2018. In that context, the 'European Water Tech Week Leeuwarden 2018' will be held from 24 to 27 September. Check it out:

[wateralliance.nl/en/event/european-water-tech-week-leeuwarden-2018](http://wateralliance.nl/en/event/european-water-tech-week-leeuwarden-2018)

# Water Tech Experience Tour



**An international group of water technology specialists paid a visit to the WaterCampus Leeuwarden on 3 November 2017. The trip was part of the 'Water Tech Experience Tour 2017'; a day-long excursion that brought a bus full of water technology specialists and other interested guests**

**from South Korea, Israel, Spain and the USA, among others, from Amsterdam to the water technology highlights of Friesland. The tour was organized in connection with Aquatech, which was held at the Amsterdam RAI from 31 October through 3 November.**

The excursion made stops at the WaterSchoon project in Sneek, the

'Blue Energy' project at the IJsselmeer Enclosure Dam (Afsluitdijk) and an innovative water treatment facility in Leeuwarden. And of course, it made a stop at the WaterCampus, where the group visited Wetsus, the Water Application Centre and the Water Alliance, among others. Welcoming the visitors at the WaterCampus were Mayor Ferd Crone of Leeuwarden, Johannes Boonstra of Wetsus and Hein Molenkamp of the Water Alliance, as well as others.

The reactions of the foreign guests to the WaterCampus visit were highly favourable. "Very interesting to see how they bring together here all different facets of the water technology chain", said Senior Researcher Jihye Kim, of the South Korean K-Water, who took part in the excursion together with several colleagues. "In our country we would like to help set up a business park for water technology companies. So there is a lot we can learn about the

approaches taken here."

Peter S. Cartwright of the similarly named consulting firm in Minneapolis (USA) was also full of praise. "Thank you for the excellent visit organized by you and your staff last Friday", he wrote a few days later. "I am amazed by the collaboration between academic, industrial and governmental entities."

For all those interested in getting better acquainted with the WaterCampus and the various centres

of expertise, facilities and businesses: The city of Leeuwarden will be the Cultural Capital of Europe in 2018. In that context, the 'European Water Tech Week Leeuwarden 2018' will be held from 24 to 27 September. Check it out: [www.wateralliance.nl](http://www.wateralliance.nl)

*Suppose you are a company and you've developed an innovative technology. Investors and customers believe in its potential and see big opportunities ahead, but they also know that new technologies and approaches bring risks, so they hesitate to take that final step. To make decisions for innovative technologies easier, there is the so-called ETV certificate within the European Union. This certificate offers the guarantee that the innovation does what it claims to do. It is recognized throughout the European Union and beyond. A Dutch player that can be a big help in navigating the certification process in the field of water technology is Benten Water Solutions (based at the WaterCampus Leeuwarden). They have been collaborating with a Polish environmental technologies verification (ETV) body since June 2017. Here, briefly, are some of the details.*

Benten Water Solutions is an independent consultancy and research firm in the fields of water quality, water quality monitoring, and sensing. The company is active in the testing of innovative technologies, together with the Centre of Expertise Water Technology (CEW) at the WaterCampus Leeuwarden. Since June, Benten has collaborated with the Polish environmental technologies verification body ('ETV body'). European ETV bodies are institutes accredited by the European Commission to assess innovative technologies. There are many verification bodies across Europe, of which the Polish Institute for Ecology of Industrial Areas (IEIA) is one.

Benten had for some time been on the lookout for an ETV body for a Spanish contact, but all the parties they previously

# Benten Water Solutions

## Collaboration with Polish authority

contacted turned out either to be too expensive or their procedures took too long. "The contact with the Polish ETV body was right on time in that regard, which meant that the Spanish contact could, in the end, get started right into an ETV procedure, efficiently and at a low cost", says Corina Carpentier, managing director at Benten. "Because of the collaboration with the Polish ETV body, we can bring our research in line with the requirements for ETV certification, which means our clients can also go right into the process of getting a certificate."

The contact was made via a matchmaking event organized by the Enterprise Europe Network during "Wasser Berlin", an international expo. At the expo, Matthijs Plijnaar, of the Water Alliance, got into a conversation with the manager of the Polish ETV body, which was looking for so-called ETV test bodies (institutes that perform or support testing). "I got talking with Ms Ratman-Klosinska", says Plijnaar. "When she told me that they were looking for test bodies, I thought that Benten might be interested. For new technologies, in particular, there aren't any standards yet. Collaboration like this, between a Dutch company and an organisation in Poland, could lower the threshold for a lot of companies to dive in and become active in innovative technologies."

Back in the Netherlands, Plijnaar passed the contact on to Benten Water Solutions.

The Dutch company and the Polish ETV body are now moving towards closer alignment of their operations and procedures, so that in the future companies will be able to undergo an ETV procedure more efficiently and therefore at lower cost.

*An ETV certificate is of great value for innovative technologies. For new technologies, in particular, there aren't any standards yet. That makes it hard to verify the qualities of an innovation, which can make it less attractive for customers to purchase the technology and for investors to invest in it. The ETV certificate guarantees that the innovation does what it claims to do, and it is recognized throughout the European Union. In addition, it can function as a step towards an international ISO standard. For an explanation of the ETV process and what it can offer you, see:*

[youtu.be/UOkTDwiZnyg](https://youtu.be/UOkTDwiZnyg)



*Isabela Ratman-Kosinska, manager of the IETU ETV body:*

# 'This cooperation will have mutual benefits'

*"Many innovations, especially those dedicated to users in the public sector, face hurdles in successful market uptake simply because purchasers do not trust them." To verify quality, potential clients typically ask about previous applications, references, and results from independent testing. It is hard to produce references, since new technologies, by definition, lack a track record of previous successful applications.*

*Environmental technology verification (ETV) is a tool to help innovative technologies avoid market failure and create a level playing field for them. ETV is a standardized process designed to provide credible, reliable and independent verification of the performance of an environmental technology and of the benefits of its use as declared by the supplier. The credibility of the ETV is assured by transparent and robust procedures and high-quality test data. ETV provides data on technology performance that can be used as the equivalent of references from previous applications and testing.*

### **Innovative solutions**

"The ETV body at the Institute for Ecology of Industrial Areas (IEIA) in Katowice, Poland, and Benten Water Solutions established their collaboration to build capacity to verify technologies under the EU's ETV pilot programme. The aim is to provide verification services for Dutch SMEs and research consortia developing and marketing innovative solutions related to water and wastewater treatment and water quality monitoring. Benton's role is to serve as a test body, providing high-quality testing data on the performance of new technologies under the guidance of the IETU ETV body. Based on the testing done by Benten."

### **EU and global market**

"Dutch technology providers will be able to verify their technologies at the IETU ETV body, which is accredited to perform verification of water treatment and monitoring technologies under the EU's ETV programme. "This cooperation will have mutual benefits" It allows Benten to extend its services by offering clients performance testing of technologies in conformance with ETV requirements." This will make it easier for Dutch SMEs to benefit from ETV, positioning their technologies a rung above the rest, in the EU and globally. The testing needed can be performed at home. For IETU's ETV body, it will be able to extend its range of operations by offering verification to Dutch clients through Benten.

**Isabela Ratman-Kosinska:**  
*'Transparent and robust procedures'*



**Länk Vaessen, CEW business developer:**  
*'This is an excellent example of the added value of the WaterCampus. As a single party, we would not have been able to get on board with this project. Moreover, these kinds of high-value ventures compel us to stay on our toes when it comes to the quality of our services.'*



### **More information**

Would you like to learn more about the European Technologies Verification Certificate and the procedures necessary to obtain it? Get in touch with Corina Carpentier of Benten Water Solutions at [info@benten-water.com](mailto:info@benten-water.com).

# Foru-Solution's floating oil vacuum cleaner

The story of Bert Sibinga and Koos Tamminga of Foru-Solution, from Harlingen, is one of getting back in the saddle. Supported by the NOM, the Waddenfonds, Groningen Seaports, and maritime service company BDS Harlingen, the entrepreneurs developed an innovative solution for dealing with oil spills: the Floating Oil Recovery Unit (FORU). It is a floating oil vacuum cleaner which can be used to clean up oil in harbours, rivers and lakes, as well as coastal and offshore areas.

## Robust Design

Getting results requires patience and the utmost faith in your innovation, according to Koos Tamminga. "You think you are finished, but the field trials point to the contrary. It is hard, but patience always perseveres." Step by step, they got closer to the perfect innovation. The testing and optimizing eventually resulted in the perfect innovation: the floating oil vacuum cleaner. It is a smart unit which can be deployed to remove oil from surface water in the event of an oil spill. Supervised by the Norwegian Coastal Administration and DNV-GL (one of the world's largest certification bodies), an extensive array of trials in the Norwegian test centre proved its functionality. "The mechanical device works like a skimmer, a surface vacuum cleaner", says Tamminga. "The unit also performs well in rough seas, thanks to its robust design and negative pressure system."

## On-location Training

The functionality is based on the idea of an empty drinking glass held upright just below the water surface. This causes a large influx of surface water. When there is oil floating on the water, it can be skimmed off and removed. The trials demonstrate that the technique is extremely effective for crude oil. The oil/water efficiency ratio is significantly higher than other skimmers from manufacturers around the globe: the device can process up to 340 m<sup>3</sup> of contaminated water per hour; the latest version pretty much fully recovers the fossil fuel from the water (85-100%). This limits environmental damage and oil waste to a minimum. The unit ships in a container and includes on-location operator training in Norway.

## Shallow Water

With support from the Waddenfonds, a smaller version has also been manufactured which is available for the Wadden area. Manoeuvring large ships with sweeping arms is difficult in the shallow Wadden Sea. "The small version of the FORU can be deployed in shallow water, making the suction system an interesting option for harbours and salvagers." There is growing interest in the product from both North and South America, Singapore, Russia, and the Middle East. "It is wonderful to make a product with both economic and societal relevance; making a living by contributing to the quality of nature and the environment. It's great!"

[foru-solution.com](http://foru-solution.com)

*"It is wonderful to make a product with both economic and societal relevance"*

## Foru Specs

### FUNCTIONS IN ROUGH WATER

The smart buoy design in combination with the position of the center of gravity, makes the FORU stick to the waves, maintaining its high efficiency

### EASY TO OPERATE

The FORU can be operated without the need of instructions. No buoyancy adjustments are needed

### HIGH RECOVERY RATE

The FORU can recover up to 45,000 barrels per 24 hours with an oil recovery ratio of 75 - 100 percent.

### EASY TO DEPLOY

The FORU can be carried by two persons, and does not require any assembly before use: Just connect the hoses and deploy the FORU system





Circular economy is advancing, and the world of water technology is no exception. One example is **Dutch company Hydraloop** from Muiderberg, which now has a second office at the WaterCampus in Leeuwarden. Hydraloop sells systems which **purify water** from showers, baths, and washing machines to reuse for washing machines, flushing toilets, or watering lawns. **An interview with CEO Arthur Valkieser.**

## *“I like the idea that I can help solve the water problem”*

Hydraloop may not seem like a logical choice for someone who ran their own media company in Hilversum for years, but Valkieser quickly explains why he made the switch. “The average person in the Netherlands uses 120 litres of clean water per day. 75% of that is unceremoniously dumped into the sewer system. And this in an age in which water is becoming an increasingly scarce commodity. It is ridiculous, really. We, as a society, need to do something about it. Luckily, awareness is growing and people are investing more and more in water saving measures. I like the idea that I can help solve the water problem.”

### **The time is ripe**

Hydraloop started around two years ago, but Valkieser has been working on the topic of water purification technology for much longer. He encountered the technology on which the current Hydraloop systems are based approximately fifteen years ago. “I was immediately enthusiastic and had one installed in my house straight away. We actually wanted to bring the equipment to market back then, but that proved to be too soon in 2006. The construction crisis of 2009 was also an obstacle, which led to us putting our plans on the back burner for a while. Construction work is

currently in heavy demand and society is becoming much more aware of issues like water use. The time is ripe for our company. Many of the people involved back then are now also part of Hydraloop. It is a shame we had to wait for a while, but it does mean that we have had fifteen years to develop and fine tune our technology.

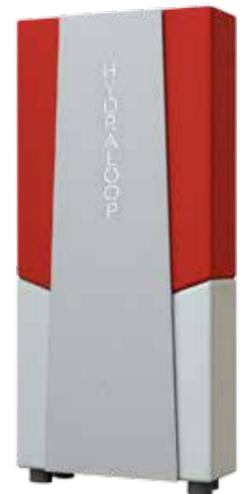
### **Solution for shortages**

Hydraloop is very promising for markets beyond the Netherlands. “Other parts of the world, such as California and South Africa, are dealing with huge water shortages. In Cape Town, for example, if you’ve used your water ration halfway through the day, your water is shut off for the rest of the day. With the Hydraloop, you can recycle more than 50% of water per day, which can help restore living comfort in such areas. Additionally, by saving water, the Hydraloop pays for itself very quickly in countries and areas where water is expensive.

Valkieser has confidence in the future.

“The technology people use in their homes has already changed so much in such a short time. Water saving is the next step. It will become a standard feature in every home. For years, it has been customary to install a central heating system when building a new

house; similarly, no house will be built without a water-saving system in the near future. And it is our job to make sure that everyone uses a Hydraloop.”



**HYDRALOOP**  
Smart water saving

### **Arthur J.L. Valkieser**

Job title: CEO & founder of Hydraloop

Marital status: married

Date of birth: 28 June 1954

Birthplace: Deventer

Hobbies: photography, piano, sailing, flying

**hydraloop.com**



# connecting global water tech hubs

## EUROPEAN WATER TECH WEEK 2018

**The global water technology sector is increasingly organized in hubs. The European Water Tech Week Leeuwarden 2018 (EWTW 2018) will connect these hubs in Leeuwarden, the United Nations Innovating City for water technology. At this special event, the sector will meet and inspire each other in the innovative climate of WaterCampus Leeuwarden.**

Innovation, technology and policy leaders from companies, universities and governments get together during several inspiring events taking place from September 24 to 27, 2018.

EWTW 2018 will among others feature the Wetsus Annual Congress 2018, Water Alliance WaterLink2018, a dedicated trade show, and a WaterCampus Experience day. All of this will be accompanied by a unique cultural program linked to water, to celebrate Leeuwarden's official status of European Capital of Culture in 2018.

The event will focus on the question how multidisciplinary cooperation can help to solve societal challenges around water. Issues like water scarcity, water pollution and water and health will be on the agenda, just like the water sector's contribution to the circular economy. Viewpoints from businesses, science and politics will be brought to you by key-note speakers from all over the world. In interactive sessions and on the trade show floor, the topics will be elaborated further and business and development opportunities will be explored.



**September 24-27**

# the Water Technology Innovation Chain

The WaterCampus brings together a complete chain of innovation for water technology, from first idea, research, specialized laboratories, various demo-sites, launching customers to commercial international applications by commercial companies. Indeed from knowledge to business. It is driven by the idea that technological development and innovation is needed to develop new markets and create new business opportunities.



# 'No regrets'

*From concrete to water purification. It may not seem like an obvious step, but Jaap Stuijver was so thrilled by Bluecon's idea that he jumped in with both feet in 2015. Three years later, Bluecon's managing director has no regrets.*

bluecon.nl

## Ready-to-use

Based in Spankeren (northeast of the city of Arnhem), the Netherlands, Bluecon is involved in compact and decentralized household wastewater purification. A Bluecon purification system can be installed on location in something as simple as a container. This means that it takes up very little space and is easy to move. The system purifies wastewater to a level at which it can be discharged into open water or reused in the surrounding area. With the system, the company provides 'blueconized' water for districts and towns ranging from 2000 to 10000 residents.

"And our process is one hundred percent physical", says Stuijver. "Water often undergoes a biological purification process, making it dependent on environmental factors. Bluecon is

different. We deliver a ready-to-use product. We can install a system within eight weeks. We also provide the service and maintenance; all the customer has to do is enjoy the product." Bluecon is mainly focused on the international market. In particular, countries in which the sewage system is not as advanced as in the Netherlands. Extensive negotiations are already underway in Turkey and Romania. Bluecon's system is an elaboration on the Dissolved Air Flotation system. "There is a one-to-one pilot system in Olburgen", says Stuijver. "Technologists have examined our system. The purified water has been tested in laboratories, and they confirm that it works."

## Trade mission

Along with Hein Molenkamp of the

Water Alliance, Stuijver travelled in the wake of the royal couple on a trade mission to Italy in June 2017. The delegation was led by the Minister for Foreign Trade and Development Cooperation, Lilliane Ploumen. The program was focused on expanding existing Italian-Dutch cooperation and starting new partnerships in the water sector. It was a great opportunity for Bluecon which led to many new contacts. Stuijver already had quite an impressive resume before he joined Bluecon. He used to work for a renowned plastic recycling company and, until a few years ago, was the managing director of a major player in the concrete industry. "The great thing about having your own company like Bluecon is the freedom of movement", says Stuijver. "You can get

things done much faster. If we have a new idea, we can respond quickly and, in principle, execute it immediately. There is nobody stopping us. Though often claimed otherwise, large companies are usually slower in this regard. Protocols stand in the way of fast implementation of innovations."

Circular economy appeals to Stuijver, and he is proud to be a part of this market with Bluecon's product. He does point out that it is different to be the face of a smaller company. "A Jaap Stuijver who enters a room on behalf of, say, Philips, has a lot more impact than a Jaap Stuijver who enters on behalf of Bluecon. Despite the fact that it is the same person in both examples, you are treated differently. I like to see that as part of the challenge."



**"our process is one hundred percent physical"**

## Jaap Stuijver

Job title: Managing Director of Bluecon  
 Marital status: married  
 Date of birth: March 2<sup>nd</sup> 1963  
 Birthplace: Elburg  
 Hobbies: Sports, behavioural science

# Grietje Zijlstra, engineer and team leader at LievenseCSO

LievenseCSO is a nationally and internationally operating multidisciplinary consultancy and engineering firm in the urban planning and environment field and in water and infrastructure. The organization, which has ten offices in the Netherlands and three abroad, specializes in urban development, multidisciplinary projects, building construction, environmental research, infrastructure, water and the environment, pipelines and high-voltage cable, and pipeline maintenance. WaterProof spoke with LievenseCSO engineer Grietje Zijlstra.

## What is your interest in water?

"The Wastewater Division of LievenseCSO in Leeuwarden was established in 1991 by the Friesland dairy cooperative and water company under the name Milfac. So we already have more than 25 years' experience in the field of wastewater research. Many of our first clients are still with us today."

## What do you do exactly in the water industry?

"We measure and sample companies' wastewater on-site. We do that in the context of the water purification and pollution levies and to monitor compliance with company discharge permits. Companies have to pay those levies for the wastewater they discharge into the sewage system (water purification levy) and surface waters (pollution levy). These levies are used to cover the costs of wastewater treatment and to maintain the quality of surface waters. We install measurement and sampling devices on-site at companies so we can take flow-proportional measurements and samples. A study

typically lasts a week. During that period, we take a daily flow-proportional sample for each 24-hour period. For companies that discharge a lot of pollutants or have large fluctuations in the pollutant content of their discharge, multiple measurement weeks have to be done. There are also companies that are listed in a wastewater coefficients table. They are charged based on their water use multiplied by a particular wastewater coefficient. If a company thinks they are being overcharged, they can have a wastewater study done to justify categorization in another class. We do those studies too. In addition, we ensure proper coordination on all this with the water authority."

## What happens to the samples?

"We send them to a STERLAB accredited laboratory, which performs the analyses for us. For companies that discharge a lot of pollutants or have large fluctuations in the pollutant content of their discharge, multiple measurement weeks have to be done. Based on the discharge stream and the chemical oxygen demand and Kjeldahl nitrogen analyses, we quantify the discharged pollutant load. These data then determine the amount of the levy that has to be paid to the water authority. The company has to file a report once annually. For a lot of companies, we take care of those reports. Some companies have their own treatment facilities, which pre-treat wastewater before it is discharged. If the wastewater has a lot of poorly degradable oxygen-binding substances in the discharge, the company can qualify for a T correction study."

## What is that?

"That is a study for determining the extent that wastewater is poorly biodegradable. By doing the study, a factor can be determined by which the chemical oxygen demand is corrected. For the poorly biodegradable part, no levy has to

be paid, because treatment can't break it down. We can provide that study for companies. In addition, we ensure that appropriate research methods are used and write the research proposal for the water authority."

## You also take measurements and samples to check compliance with discharge permits. Can you say a little more about that?

"In that case, the company has a permit that includes certain stipulations. We then test whether the wastewater discharged complies with the specifications set. If they are exceeded, we get in touch with the customer and give them advice. There are also companies that are listed in the wastewater coefficients table. They are charged based on their water use multiplied by a particular wastewater coefficient. If a company thinks they are being overcharged, they can have a wastewater study done to justify categorization in another class. We do those studies too. In addition, we ensure proper coordination on all this with the water authority."

## What is your USP?

"Beyond our knowledge and expertise, we maintain short lines of communication with our customers, flexibility, real involvement with the client and good contacts with water and tax authorities."

## What do you see as the most important development in the coming five years?

"The development of sensors in the wastewater field and use of sensors in measurement. There is also the ongoing computerization and digitalization of data."

## Do you have a personal motto?

"I'm satisfied if our customers are satisfied."



"I'm satisfied if our customers are satisfied"



Join the European Water Technology Hub!

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