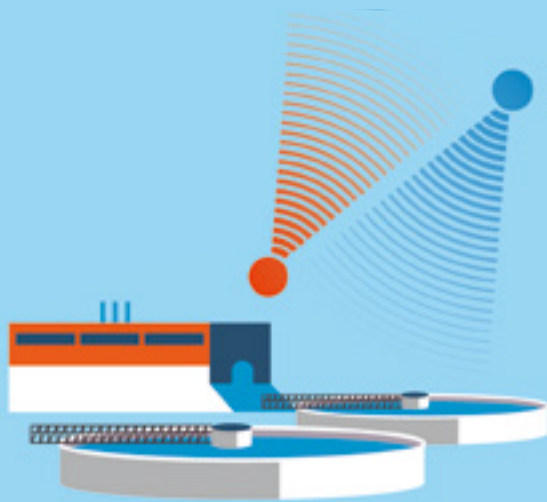


# wave

*Insights from Veolia Water Technologies*



*What's new in 2018?*





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# AQUAVISTA™

## DIGITAL SERVICES



## Boost your water value

The world of water is changing: treatment is more complex, resources are declining, customers expect more, operational costs are rising, water and wastewater operations will need to adapt.

Part of the Veolia group, the global leader in optimized resource management, Veolia Water Technologies offers the most important portfolio of technologies, standard products and services to help municipalities and industrial companies to face these challenges.

Regarding the quality of their water, our customers also needed reliable data available in real-time 24/7 on a secure platform this is why we created AQUAVISTA™, digital services. This new platform of digital services provides a smarter management of your water treatment systems.

As a unique digital platform, Aquavista is entirely dedicated to water treatment applications. With Aquavista you have a smart partner – based on Internet-of-Things and advanced data analytics from Veolia Water Technologies, you have the opportunity to access the best water expertise for both water and wastewater treatment, for your installations and for your equipment.

In connecting your equipment to a highly secured platform you will have a privileged access, in real time, to the heart of your operations.

In the following pages, discover how we can help you to address your water challenges.



## INTERVIEW

# Jean-François Nogrette, CEO & Aude Giard, Chief Digital Officer Veolia Water Technologies



## What are the main challenges of the water world?

Jean-François Nogrette: *We often talk about the issue of access to water. This is of course a very important topic that needs to be addressed, along with access to sanitation and the importance of water reuse. But there is another topic that we don't address as much, and that I feel is very important, and that is the issue of trust.*

*In many parts of the world, we are sharing, exchanging and reusing water in various ways, through many different partners at a much faster pace than ever before. These exchanges must be based on trust, and trust can only be established through information.*

*Information about water quality, of course, quality of the water coming in, quality and composition of the water going out, but also information about chemical consumption, about the amount of sludge generated, of biogas produced and energy used. Information about hydraulics, about the network, even about the weather.*

*This information must be accurate and reliable, it must be available in*

*real time, over a long period of time.*

## How can we get an accurate and reliable information?

JFN: *This information can be obtained by establishing the digital plant.*

*For me, the digital plant is a lever to boost operational performance and it is also a way to solidify a long-term pact with the client. This pact of trust is based on real-time data paired with water treatment expertise and a worldwide benchmark.*

*The world is changing fast, technologies need to respond to an increasingly complex environment and help us address the challenges of water scarcity and water reuse. And as I mentioned before, they need to secure the trust of the client and of the end-user.*

*Water is either an ingredient of customers' value creation or a cost of compliance but either way, it needs to flow as per expectations. Implementing a digital plant can help clients focus on their own business value and on the performance of their daily operations.*

*These digital tools need to be flexible, they need to be available 24/7, and most importantly, they need to be available on a highly secured Cloud platform. This is how we can provide information to our clients and establish a long-term relationship based on trust.*

## Could you give us an example of the benefits of a digital plant?

Aude Giard: *Yes of course, we have several projects. One example is our customer BlueKolding who optimized its energy consumption thanks to our digital offer AQUAVISTA™.*

*BlueKolding is an environment, energy, and climate company which covers the entire municipality of Kolding in Denmark. They are inspired by the concept of blue economy and are constantly working to find new ways of exploiting the resources in wastewater and improving processes to clean it.*

*Veolia has been working with BlueKolding for several years. In 2017, they decided to adopt our digital service offering Aquavista. Doing this gave them access to a sort of digital autopilot at the service of energy optimization, while maintaining*

robust and sustainable water treatment.

They had the flexibility to choose which features of AQUAVISTA™ they wanted to activate on the processes in their plant. They have access to real-time cloud-based information that optimizes energy use and energy production through biogas. It also optimizes sludge production and recirculation, and it optimizes chemical usage.

**How far does Aquavista help the municipalities and industrial companies to better operate their plants?**

AG: AQUAVISTA™ is a complete suite of digital services using internet-of-things, advanced analytics and our water treatment expertise. We developed Aquavista on several of our existing technologies, on solutions provided to our customers during these past few decades and on our design & build experience. We are really lucky to be able to take advantage of these VWT long-term experiences. Innovation is in our DNA and we count on this new offer to improve the operations of our clients' plants.

AQUAVISTA™ is not just one offer, it presents four different modules which can be adapted to our different clients' needs.

A customer portal which provides real-time remote monitoring of equipment and alert management to our clients.

The AQUAVISTA™ Plant, our most complete offer, is a stack of remote controls algorithms that embed twenty five years of process knowledge of our engineers in Denmark. This product provides real-time remote controls on drinking water & wastewater treatment plants (municipal and industrial).

We have some other modules in the pipeline, for example, a module called "Assist" which aims to provide our customers with remote expertise by giving access to the network of VWT process and commissioning engineers (water quality reports, compliance reports, online expertise, etc.).

And we have an "Insight" module, based on more advanced analytics, looking at long-term data, liaising operational information and

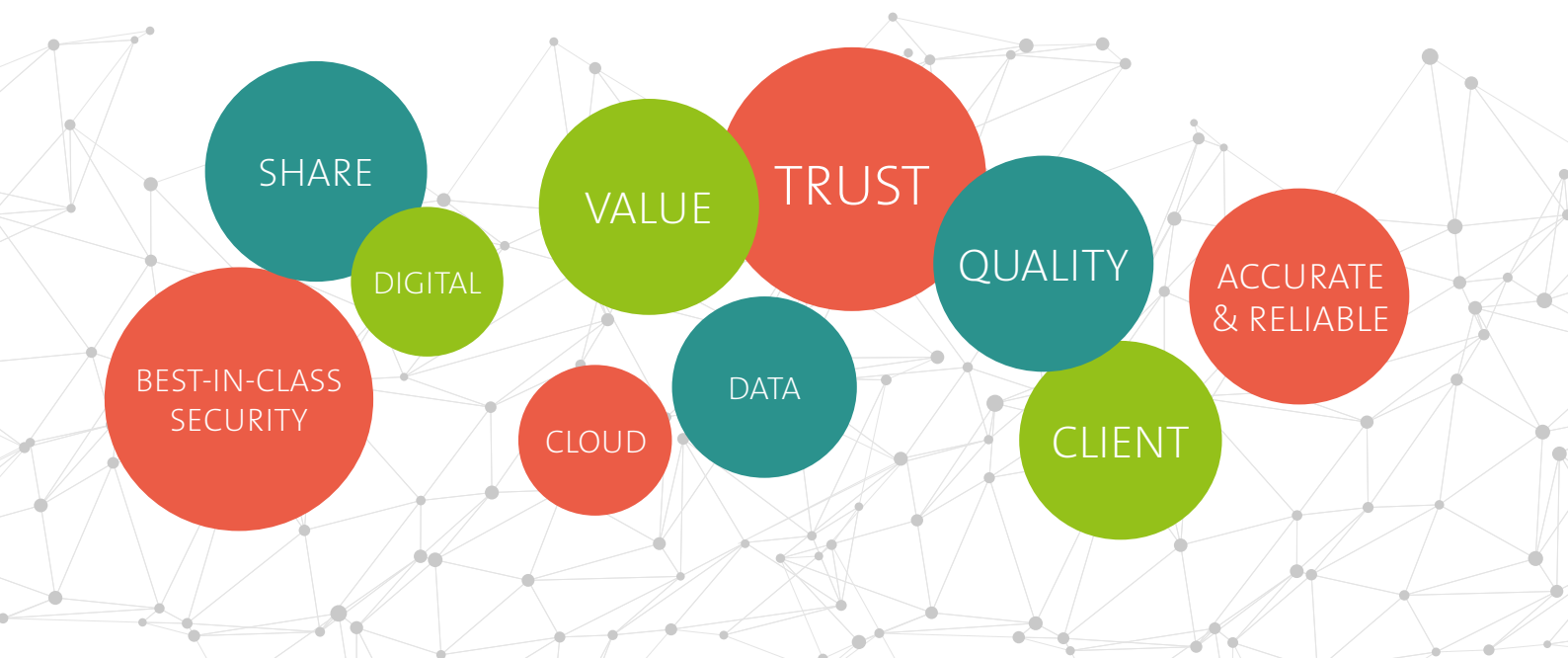
financial information to deliver business decision KPIs and enable operators and managers to simulate the impact of an operational decision.

As a digital services solution, AQUAVISTA™ is value driven.

Our ambition is to deliver high value services to our customers and address their key business stakes and industrial challenges :

- increase their operational efficiency and plant uptime,
- improve their water quality anytime anywhere
- ensure the output effluent complies with regulation for a better environmental footprint
- work on the complex energy exchanges the plant perimeters: biogas management optimization, SMARTGrid and energy balance, water network optimization, etc

Connecting our customers to Aquavista will make them better operators of our technologies and will boost their own value creation! ●



# AQUAVISTA™

*the water digital service*



## AQUAVISTA™ Portal

### KEY FEATURES

Single point of reference for all information relating to your water treatment system:

- real-time remote monitoring of equipment data,
- dynamic alarm management and information for operators,
- key information about service contracts and reports,
- archive of all service and sales orders,
- access to equipment data: user guides, performance documents, calibration certificates, documentation for a specific site, O&M manuals and training videos/materials for operation of selected technologies,
- notification of events for equipment.

### ADDED VALUE

- Improvement of preventive maintenance through dynamic alarm management,
- access data from multiple sites via a single point of entry,
- private and secure,
- 24/7 managed service,
- ATAWAD: Any Time, AnyWhere, Any Device,
- improves convenience and simplifies operations.



## AQUAVISTA™ Insight

### KEY FEATURES

Through remote access to an information dashboard, benchmarks and suggestions for process optimization, AQUAVISTA™ provides:

- key operational information overview,
- analysis of technology units performance,
- global benchmarks (comparison, scenario and optimization).

This data-driven optimization of equipment performance could ultimately result in a full auto-pilot solution.

### ADDED VALUE

A dashboard for managers, operators and engineers, built in conjunction with the existing AQUAVISTA™ Portal and leading to:

- global benchmarking,
- continuous optimization review,
- monitoring of key performance indicators.





## AQUAVISTA™ Assist

### KEY FEATURES

Support operators' treatment processes through access in real time to knowledge, digital training and a network of process engineers for:

- › advice in a timely manner, enabled by data as well as a consistent platform,
- › a better understanding of the specific end users' operations,
- › an improved risk mitigation to meet your challenges (compliance, plant shutdown, etc.).



### ADDED VALUE

- › Community management where operators can communicate and share knowledge with other operators and Veolia process engineers.
- › Operators can request support from Veolia Water Technologies (site visit, online assistance for maintenance service, troubleshooting, emergency support).

## AQUAVISTA™ Plant

AQUAVISTA™ Plant is a holistic solution:

- › a suite of intelligent software solutions,
- › a state-of-the-art plant overview,
- › an online control & forecasting tool.

AQUAVISTA™ Plant is implemented across several countries with hundreds of plants already connected.

It is suitable for small and large municipal and industrial wastewater plants.



# BlueKolding,

*inspired by the concept of blue economy*

## BlueKolding A/S

BlueKolding A/S Environment, energy and climate company covers the entire municipality of Kolding, Denmark. BlueKolding is constantly working to find new ways of utilising the resources in wastewater and improving processes for cleaning it. BlueKolding manages the treatment of 15 million m<sup>3</sup> of wastewater for the city of Kolding and its surrounding area every year. 12 million m<sup>3</sup> goes to Agtrup central wastewater treatment plant (WWTP).

### BlueKolding's needs

For many years BlueKolding has prioritised and applied software solutions for capacity extension and operations optimisation for the entire sewerage system; from the sewer network to the wastewater treatment plants. The aim is to maximise the use of the existing facilities and at the same time guarantee an optimum and compliant operation under all conditions, i.e. under dry and wet weather conditions. BlueKolding wishes to provide its staff with efficient tools to ensure a good overview of all the utility's systems.

### The AQUAVISTA™ Plant answers

In 2007, the aim for Agtrup WWTP was to improve the effluent quality and ensure operational savings. The result was 25% lower Total-N and a reduction of the chemical precipitant by 45%.

The introduction of integrated control of Agtrup WWTP and the sewer system in 2011 secured 80% higher hydraulic load at the plant and therefore reduced the costs of the planned basin extensions by 22% the costs of the planned basin extensions. At the same time, BlueKolding even managed to reduce the number of overflow events from approx. 35 to <10 per year thanks to Aquavista Plant.

In 2012 and 2013 three satellite WWTP's were furnished with AQUAVISTA™ Plant. The purpose was to ensure a stable operation and maximise the operational savings by providing the staff with the relevant software for optimising the plants.

In 2017, BlueKolding extended its software solution on the new cloud platform AQUAVISTA™ Plant by the integrated control of Agtrup WWTP together with the sewer network for the City of Kolding as well as the three satellite WWTPs.

Over the years BlueKolding has experienced compliant operation under all conditions by active online control with far less manpower than is required for visits to the satellite plants.

### The concrete benefits for BlueKolding:

- 25% less Total-N in effluent,
- Precipitation in chemicals reduced by 45%,
- Hydraulic capacity increased by 80%,
- Overflow in catchment area reduced 45%.

*"The AQUAVISTA™ Plant has helped us to lower the costs of our operations and helped us to have a better carbon footprint as well. And now it's cloud-based and that means that our data security is on a very high level and that's very important to us."* Per Holm, BlueKolding CEO.

*"Using AQUAVISTA™ Plant our processes are optimised, meaning that the plants produce compliant effluent at the lowest cost. A new function with Aquavista Plant is that we can programme ourselves. If we get a new sensor we can create a short control feature for it and afterwards we can discuss the feature with Veolia. I think that this is very interesting."* Karin Refsgaard, BlueKolding operations manager.



### Innovation projects

Since the 2011 implementation, Veolia Water Technologies and BlueKolding have collaborated to develop various software solutions for intelligent use of a large amounts of data from the entire sewerage system, i.e. the sewer network and the treatment plants.

The latest innovation projects are from 2014 (SMARTGrid) and 2017 (BlueGrid). Both focus on energy-balance optimisation through utilisation of the basin volume in the catchment area as part of the active control strategy at the WWTPs.

#### **AQUAVISTA™ Plant is a real-time remote control and optimization of drinking water treatment plant, sewer network & wastewater treatment plant processes.**

This holistic solution covers different objectives in different customer segments.

The main objectives, no matter the customer segment, are:

- CAPEX savings/avoidance by additional hydraulic capacity
- CAPEX savings/avoidance by additional biological capacity
- OPEX savings by optimised operation
- Compliance through stable operation, easier operation, created operator awareness and improved system understanding

Aquavista Plant covers different types of processes. The main processes covered, no matter the customer segment, are:

- Aerobic wastewater treatment (municipal or industrial)
  - > Activated sludge
  - > Biofilters
  - > MBBR
- Anaerobic wastewater treatment (industrial)
  - > UASB
- Anaerobic sludge treatment
  - > Digesters

Aquavista Plant is implemented across several countries with hundreds of plants already connected.

# Water quality for a laboratory monitored by AQUAVISTA™

## **The Biochemical & Molecular Biology laboratory at Nîmes University Hospital**

has four main activities: the Biochemistry, Hormonology, Biological Oncology and General Toxicology-Pharmacology sectors, for both routine and emergencies; the Toxicology and specialized and forensic Pharmacology sector; the Molecular Genetics sector (somatic oncogenetics, neurogenetics, constitutional pharmacogenetics) and finally a delocalized Biology sector.

The laboratory team is composed of 41 staff, of which 26 technicians who are mainly in charge of the maintenance of the analysers and the technical validation of the examinations and also nine medical biologists who ensure, among other things, the medical expertise of the laboratory examinations through the provision of advice to clinicians and a university teaching activity.

The laboratory operates 7 days a week and 24 hours a day and on average the laboratory processes 1200 samples/day and produces 2.4 million procedures/year.

The Biochemical & Molecular Biology laboratory at Nîmes University Hospital has been using Roche Diagnostics and Veolia solutions since 2013. This solution is differentiated by a complete analytical

offer that allows laboratory technicians and medical biologists to have real-time access to water quality monitoring and to intervene within the scope of preventive and curative maintenance actions.

## **Traceability at the heart of the laboratory**

The current era of medical biology laboratories is the consolidation of analytical solutions (grouping of several analysers into a single one) for medico-economic aspects to ensure greater traceability in sample processing procedures, while optimising the analysers' performance and production.

*“Previously, each analyser had a dedicated water supply, today a single water production plant must be able to produce a sufficient volume of water while ensuring an irreproachable water quality, as this is an essential part of the analytical process at the origin of the production of patient examination results”,* explains Dr David-Paul De Brauwere, hospital practitioner at the Biochemical & Molecular Biology laboratory. These automated technical platforms are at the heart of the laboratory's organisation; they make it possible to manage high flows while meeting the quality and traceability standards required by regulations.

Roche Diagnostics France supports laboratories in this evolution by offering high-performance, proven analytical solutions for automated technical platforms.

Clinical analysers need a constant, safe and compliant supply of water to produce and reproduce reliable diagnostic tests. Roche and Veolia's offer meets this requirement for quality and traceability. It includes both the Roche product lines (cobas®8000), Medica Pro for water supply and the user interface with the AQUAVISTA™ portal for real-time water quality monitoring.



### An interface that facilitates the accreditation process

By 2020, 100% of the NABM examinations produced by a laboratory must be certified. The COFRAC (COmité FRançais d'ACcréditation - French Certification Authority) is in charge of issuing these certificates to medical biology laboratories who must meet the specific requirements concerning competence and quality required by standard NF EN ISO 15 189.

With a view to full accreditation in 2 years: *“access to an interface that centralises water quality histories and allows us to view all these main parameters on a single page - temperature, conductivity, resistivity - provide a guarantee of traceability; as well as access to the calendar of events, allowing us to view the history of alarms. We become more efficient! We can immediately provide all the information requested during the COFRAC audits”,* says Dr De Brauwere.

### Anticipating risks: preventive maintenance

Every day, the technicians check the water quality from the AQUAVISTA™ Portal. Thanks to the graphs, they can see if the water quality is deteriorating, and if necessary, act preventively by changing the Medica Pro filtration cartridges.

*“For example, regarding resistivity, we evaluated at 18 hours the interval between the beginning of its deterioration and its impact on water quality and therefore on the results of patient examinations. Water quality is at the heart of the laboratory's activity in order to ensure a constant quality service in the production of test results while guaranteeing the performance of our production: over 1,000 samples are processed every day; 24/7 reproducibility of analytical processes is essential for rigorous monitoring of patients' biological parameters.”*

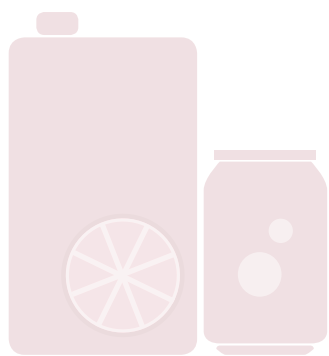
When an alarm sounds, or when one of the water quality monitoring parameters shows a deterioration of the water quality, the technicians intervene immediately as part of a preventive maintenance action.

*“This type of early warning has enabled us to reduce the number of alarms since the solution has been deployed in our department”,* concludes Dr De Brauwere. ●

**Customer:** Roche Diagnostics

**End user:** Biochemical and Molecular Biology Laboratory at Nîmes University Hospital (CHU de Nîmes)

**Solutions:** cobas®8000 (Roche Diagnostics), Medica Pro & AQUAVISTA™ Digital Services from Veolia Water Technologies



# AQUAVISTA™ for a soft drink manufacturer,

## Portal, Insight & Assist

**Food and Beverage companies** currently face several challenges with water management, which is especially true concerning ingredient water used in the actual product. It is a key challenge to monitor in real-time the quality of their ingredient water in order to ensure the maximum traceability of the production processes to ensure compliance to increasingly stricter regulations.

### Project Scope

In September 2015, a 100m<sup>3</sup>/h water treatment plant for a global beverage leader was installed in North Africa. The solution implemented is BERKEFELD PurBev®, a range of hygienic water treatment solutions for the food & beverage industries consisting of reverse osmosis, activated carbon and ultrafiltration technologies. This beverage company was looking for a way to considerably improve the monitoring of their ingredient water. One of the client's main objectives was to improve their water consumption KPI liter to liter.

### The Problem

During operation the performance of both ultrafiltration units had severely and abruptly declined. Discussions, analysis and various counter measures such as CIP procedures on site had been carried out without sustainably solving the problem. Since a further degradation of the UF performance would have led to a shutdown of the plant causing considerable damages and costs, an action plan was defined by Veolia Water Technologies engineers. The main objectives:

- Determination of root causes of rapid differential pressure increase
- Reduction of the differential pressure of the UF systems by performing modified CIP
- Inspection of the dosing equipment and dosing rates
- Check of chemical quality and concentration

### The Action

As Aquavista Portal, Insight and Assist was implemented, process experts were able to investigate the causes based on the available data and trends from the previous months and to suggest counter actions in a timely manner. The Aquavista digital services modules provided are Portal, Insight and Assist. The Aquavista Services has successfully allowed the company to closely monitor their ingredient water in real-time by monitoring the parameters of PurBev, with an ATAWAD (AnyTime, AnyWhere, Any Device) access to this information.



### AQUAVISTA Key Features:

- Remote monitoring of parameters
- Remote control on demand
- Operations reporting

- Feedback on performance and recommendations for optimization
- Training in local language
- HYDREX® service with special chemicals



The client benefits from more process support and expertise to operate the water treatment plant, as well as from high value digital services.

*“We are very satisfied with the new Veolia performance monitoring service. This really is a high value service which helps us to reduce operational cost and improve the reliability of our water treatment plant. Veolia’s digitalisation strategy is the right step to differentiate its services further from competition”* engineering director, April 2017.

This project has not only allowed for the client to benefit from increased reliability but also from increased plant uptime and an overall improvement in performance. The client feedback and testing has allowed us at Veolia to considerably improve our technologies, services and the PurBev design. ●

### Client Benefits

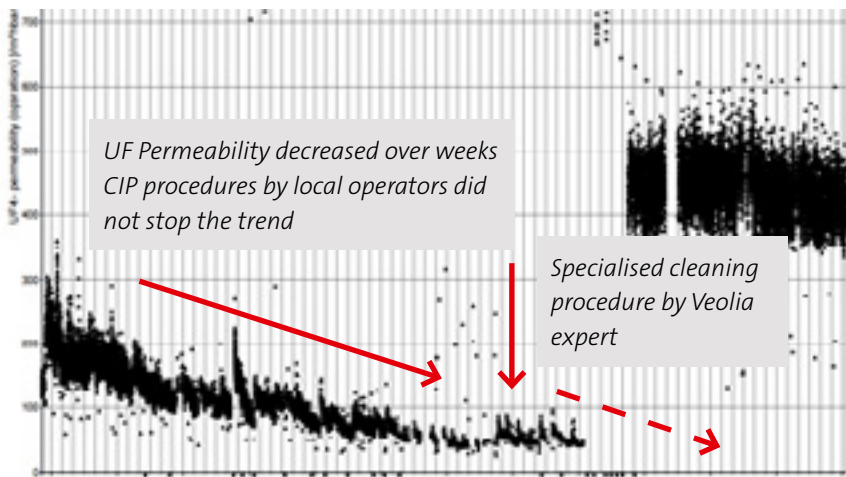
The introduction of digital services in the water treatment plant at this production site has provided technical and operational benefits for the client. Their processes and plant is now more reliable and they were able to reduce their operating costs.

They are able to now fully access real-time data on their ingredient water and monitor the quality of it according to the regulations, and more importantly, to their specifications. A full team of Veolia experts are in charge of analysing the reports generated from the KPIs and send out immediate feedback in case of any problem. These experts also provide recommendations and advice on how to improve operations.

### KPIs

**Benefits**

- Increased membrane lifetime from 8-12 months to 2,5 y
- Reduced liter-to-litre KPI from 3,0 to 1,8l
- Prevented 5-8 days downtime, equivalent to many thousands kilo €



# AQUAVISTA™

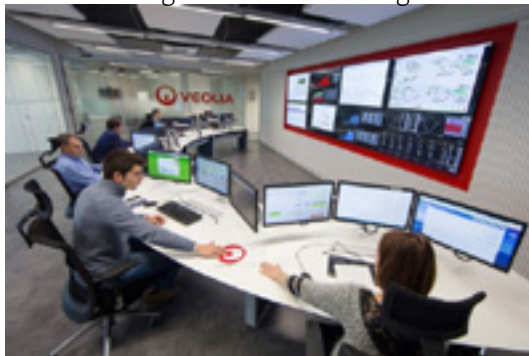
## for the Oil & Gas Industry

*a new era in service solutions for Water Injection  
Asset Integrity Management*

**Veolia's unique combination** of a digitized system with expert engineers now provides upstream water injection assurity.

Our expertise in facility asset management has been gained from decades of experience in operations enabling us to balance conflicting drivers and deliver pragmatic outcomes based on the actual production needs of the Industry.

In the challenge to meet the oil & gas



industry's need for improved operation and reduced OPEX, Veolia has developed the AQUAVISTA™ digital services platform that allows smarter management of our client's upstream water injection systems; improving performance, minimising operational risk, whilst reducing OPEX.

Existing methods of handling and assessing upstream asset data was problematic as a service provider onshore. Aquavista, Veolia's real time monitoring service, delivers early warning of deteriorating performance and operational issues, giving unprecedented

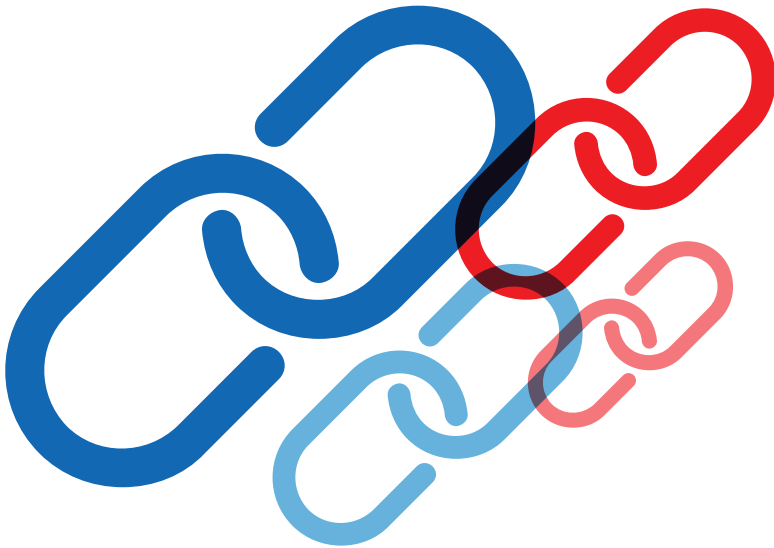
visibility into the performance of the water injection system. Combined with the onshore process specialist delivered by Veolia through Aquavista Assist, a service of true value is integrated into the customer's teams, both onshore and offshore.

Using OSIsoft PI, Aquavista will transform upstream water injection operations; unlocking the value of your data to transform it into relevant business driven operations. Aquavista improves water injection system performance:

- Real-time upstream data capture onshore
- Business KPI's for water injection
- Laboratory analytics and manual offshore batch control inputs
- Generates "benchmarking" performance KPI's.
- Technical and process support by Veolia specialists.
- Bespoke water injection operational support for unlocking availability and reliability
- Optimised chemical consumptions and performance
- Early event detection notification for operational risk reduction

**The key benefits to our clients: water injection assurity - providing increased oil recovery and reduced OPEX**





## EVA Link remote control

### *The new smart EVALED evaporators management.*

*EVA Link is the new service pack dedicated to EVALED evaporators which allows to monitor your water treatment unit from smartphone, tablets and PC.*

#### APPLICATIONS

- Ideal to optimise EVALED evaporators' water treatment performances and reducing running costs.

#### BENEFITS

- Real time data and trends check-up
- Monthly data check-up and back-up (with technical comments only with the GOLD level service pack)
- Alarms notification via e-mail/SMS
- Minor modifications on PLC and HMI's softwares upgrading
- Veolia's technical personnel will intervene via online request.

- Alarm notification can be set up for rapid troubleshooting from Veolia personnel (available in the GOLD level service pack).

#### FEATURES

- Access to your water treatment unit from any device (PC, tablet, smartphone)
- No software or license to buy
- Password security protocol with double access level.

#### REFERENCES

##### **Food & Beverage, Candies production (CANADA)**



Remote operation and assistance, Monthly detailed reporting, Technical suggestions for process optimisation, Reduction of maintenance activities and costs.

##### **Chemical, Detergents production (ITALY)**



Remote operation and assistance, immediate support and troubleshooting, Reduction of non-scheduled maintenance activities and consequent downtimes.

# ACTIFLO<sup>®</sup>,

**one of the highest performing clarifiers  
in the world boosted by digitalisation**

Actiflo is a **high rate compact water clarification process** in which water is flocculated with microsand and polymer in a Turbomix<sup>®</sup> draft tube. The microsand enhances the formation of robust flocs and acts as ballast, significantly increasing their settling velocity. The unique characteristics of the resulting microsand ballasted flocs allow for clarifier designs with very short retention times, high rise rates and extremely compact system footprints that are **up to 50 times smaller than other clarification processes of similar capacity**. It counts **more than 1,000 references all over the world**, for municipal and industrial water and wastewater treatment over the past 25 years (see page 25 to know more about Actiflo).

The **AQUAVISTA™** team works with the technical department and the data scientists of Veolia to improve the performance of the Actiflo thanks to the digitalisation. In light of the market needs, are developed Aquavista Insight and Assist.

## AQUAVISTA™ Insight

Plant operators are faced with increasing demands for continuous process optimisation, reduction of water, wastewater, chemical and energy consumption, while not jeopardising the process stability and meeting strict regulations. To support clients in this crux, Aquavista Insight aggregates historic data acquired from multiple Actiflo around the world and real-time data from site, and applies analytics developed based on Veolia's experience in designing and operating water and wastewater treatment plants worldwide.

### Features

- **Asset monitoring:** Correlation of process data with operational costs

- **Asset improvement:** scenarii for
  - Operational cost savings
  - Effluent quality improvement and stability
  - Throughput increase
- **Asset Benchmarking:** Comparison of multiple sites or the same site over different seasons

### Benefits

Aquavista Insight gives the plant managers more peace of mind by:

- **An improved operation of the Actiflo:** real-time optimisation of the plant based on historical data and intelligent algorithms.
- **Having a greater stability of downstream treatment:** by an optimised clarified water quality, the lifetime of the downstream filters are increased and the process stabilised.
- **Reducing operational costs:** reduced polymer and coagulant consumption. In one plant 19,8% chemical savings.
- **Increasing resilience of the operation:** improved up-time of the operation and increased predictability of the operation.
- **Ensuring compliance** by increase operational resilience.
- **Learning from comparable sites:** Evaluate the performance of different sites to apply lessons learned throughout.

*“By adding Veolia’s process expertise to the new digital tools we can go much further in monitoring and optimizing the quality of treatment. We have access to an “enhanced” process control adapted to each site, which represents a real optimization compared to what we had with scientific formulas alone.*

*In addition, thanks to the Aquavista Insight dashboard, operators have a global and comprehensive vision of their installations. The operator thus benefits from a continuous supervision and optimization service.” Philippe Bréant, projects department director, Veolia Research & Innovation.*

*In cooperation with our customers, we have carried out several tests on their Actiflo. Aquavista Insight has a real impact on their operating expenses, the processes carried out on the various operations are optimized, which in turn extends the equipment’s durability. We can see a real optimisation of the operation of the plant and water quality”, Philippe Sauvignet, water industrialization manager, Veolia technical & performance department.*

### AQUAVISTA™ Assist

The framework under which a plant is operated is challenging: technologies are highly complex, new developments occur at a fast speed, the number of operators is declining and there is often little time for training. In a day to day operation it is thus challenging to solve complex problems or improve operation.

#### Features

- **Communication platform:** Channels to exchange with operators from different sites
- **Virtual process engineer:** Specialized support from a network of experienced Veolia experts

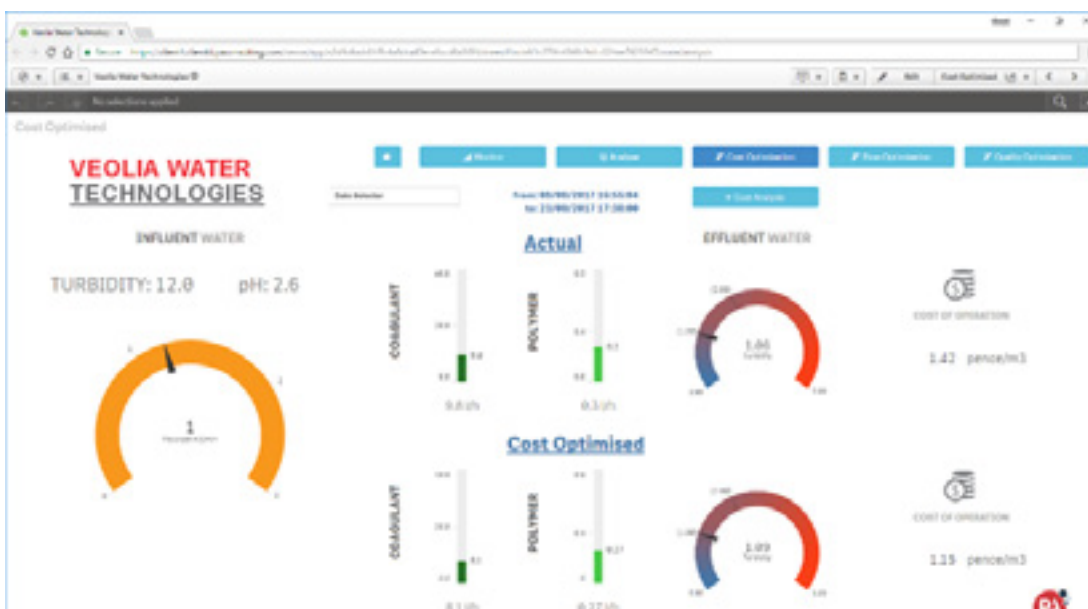
- **Online training materials:** Documents/ videos on process troubleshooting, maintenance etc.

#### Benefits

To support you in this, Veolia is developing AQUAVISTA™ Assist, a suite of digital communication channels and training modules. It is based on a long-term experience of troubleshooting, maintenance and process knowledge that have been compiled into training materials, as well as access to experts at your own convenience. AQUAVISTA™ Assist will give more agility to Actiflo operators, and will secure the equipment by:

- **Having a direct line to process experts from Veolia** to support with day to day questions, pro-actively ensuring that problems are resolved avoiding plant downtime
- **Knowledge sharing** with other sites
- **Providing continuous development of operators**, by attending training sessions or revising materials at the operator’s own speed and time
- **Facilitating onboarding of new operators** by giving them access to a library of step-by-step training videos, troubleshooting support and process knowledge

If combined with AQUAVISTA™ Portal, Veolia experts can access real-time data and provide even more powerful advice. ●



# AQUAVISTA™ Certification



AQUAVISTA™ is embedded by design in standard equipment made by Veolia Water Technologies.

All our

AQUAVISTA™-compatible technologies will be stamped and certified by Veolia Water Technologies as able to be integrated within the AQUAVISTA™ environment.



Scan the QR Code and discover new digital features for your technology ►



# AQUAVISTA™, digital trust

**Digital transformation** is no longer a buzzword: it has become a reality. The growing connectivity of equipment, people and businesses has profoundly changed the entire landscape in which businesses are operated and is quickly becoming a key parameter of success for companies all over the world. The amount of data captured through these connected systems, the big data, processed with intelligence in cloud gives a way to optimise the processes and increase the overall efficiency. Hence it needs to be protected and the channels through which it transits must be controlled and secured to ensure that it is only available to those for whom it is meant.

The increasing digital connectedness of the entire value chain creates agility and procures flexibility, but it also demands that cybersecurity risks and threats be effectively assessed and thwarted. The key is to address these challenges by embedding security at the core of platform design.

At Veolia Water Technologies, we believe that security is better and stronger when it is built in and not bolted on. Our Digital Platform, AQUAVISTA™, is built with security at its core. Cybersecurity aspects are considered as vital to the design and architecture of the platform, and we ensure that best-in-class security practices are enforced over the entire infrastructure.

Physical Security, Network Security and Cloud Security: the complete digital landscape is addressed.

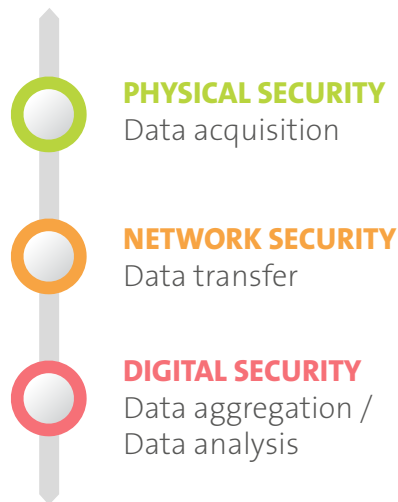
**Physical security** means that the phase where the data is acquired is safe. This is achieved by ensuring the physical security of the device or equipment, of course, but also through secured accessibility and data encryption. Veolia Water Technologies complies with all industry standards.

**Network security** covers data transfer. We ensure that the data transits through secured tunnels and that the protocols used for data communication are secured and recognized by registered regulation entities. Moreover, network-enforced policies are put in place.

**Cloud security** is all about safe data aggregation and safe data analysis. On a cloud architecture, security is in place by design. A dedicated team of security experts with access to state-of-the-art tools manages the security and applies continuous security improvement strategies, while also conducting penetration tests and security audits. We ensure cybersecurity compliance (NSIT/IES

Standards) and apply industry-proven security architecture practices.

The value and the volume of data have never been higher, affording users with a level of information and flexibility that has never been seen before, but which could also potentially make businesses more vulnerable than ever before. It is imperative that we maintain confidentiality, integrity and availability of the data and Veolia Water Technologies is committed to do so in partnership with our clients. ●



# Smart glasses:

## *how to support your plant's operations?*

### VIRTUAL SUPPORT

#### User

Operator or technician on site

#### Features & Added Values

- Access to manuals and checklists (document/videos) → Remember to perform all tasks in the correct order
- Live video calling → Troubleshooting support from the back-office, enabling them to see exactly what you are seeing and instructing you
- Shoot pictures or videos → Record your steps for quality assurance
- Hands-free glasses → Increased safety precaution, focus on tasks

### 3D/AUGMENTED REALITY

#### User

Engineer, operator, technician during training or inspection, off-site

#### Features & Added Values

- Walk around a 3D image of a plant on a computer → no need for glasses
- Familiarise and train operators on a new plant → increased safety, time savings
- Tag equipments with datasheets or points of precaution → ease of use, ensure data transfer, increased health and safety

### MIXED REALITY

#### User

Operator or technician on site

#### Features & Added Values

- Instructions superimposed on your actual field of view → Read instructions and highlights while seeing the equipment in front of you

- Live video calling & annotations → Support from back-office that can instantaneously annotate things in your field of view
- Hands-free glasses → Increased safety precaution, focus on tasks

### VIRTUAL REALITY

#### User

Engineer, operator, technician during training or design phase, off-site

#### Features & Added Values

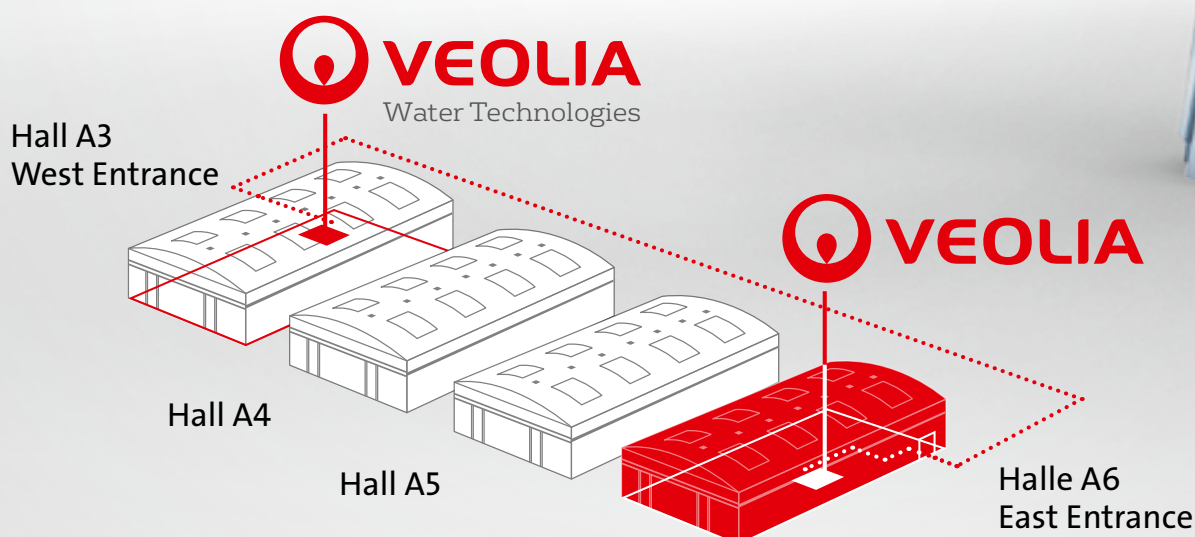
- Simulated image of an equipment/plant in 3D → walk inside a plant before doing it in real life, increased safety
- Explode the equipment → Understand how the equipment is built, facilitating maintenance services
- Build 3D representation of the build environment, e.g. for refurbishments before implementing them in real life → time savings, cost savings, safety precautions



# *Veolia Deutschland* is looking forward to meeting you.

Our cutting-edge solutions in the waste management, water, and energy utility sectors combine innovation and efficiency with the power of digitization. Take a closer look at all we have to offer.

Visit us at **Hall A6, Booth 339/438.**



[www.veolia.de](http://www.veolia.de)

Resourcing the world





# EVALED®

## *Evaporation technologies for wastewater treatment*

### APPLICATIONS

- Effective solutions for the treatment of industrial wastewater, concentrating and removing salts, heavy metals and a variety of hazardous components.

### PERFORMANCES

- ZLD
- Water reuse
- Valuable matter recovery
- Up to 95% distillate yield
- Sizes from 0.1 to 200 m<sup>3</sup>/day of distillate produced

### BENEFITS

- Waste disposal costs reduction
- Low energy consumption
- Fully automatic, minimum labor
- Remotely controllable (Industry 4.0 compliant)
- Standard & Package design
- Small footprint, Plug & Play
- High quality of distillate

Evaled is now boosted by our digital services offer AQUAVISTA™



# ACTIFLO®

## *The ultimate microsand ballasted clarifier*

**With more than 1,000 references** all over the world, Actiflo has been in use for municipal and industrial water and wastewater treatment for more than 25 years.

Actiflo is a high rate compact water clarification process in which water is flocculated with microsand and polymer in a Turbomix® draft tube. The microsand enhances the formation of robust flocs and acts as ballast, significantly increasing their settling velocity. The unique characteristics of the resulting microsand ballasted flocs allow for clarifier designs with very short retention times, high rise rates and extremely compact system footprints that are up to 50 times smaller than other clarification processes of similar capacity.

### Major benefits:

- Extremely compact footprint
- Rapid start-up within few minutes
- Clarifier rise rates of 80 m/h and higher
- Excellent treated water quality
- Stable and flexible process behavior
- Automatic operation with frequent start-ups & shut-downs possible

- Proven process with 735 references in 55 countries for
  - Drinking water treatment
  - Municipal wastewater treatment
  - Industrial water and wastewater treatment

Actiflo is now boosted by our digital services offer: AQUAVISTA™ (see pages 18 & 19)

### REFERENCES

#### Severn Trent Water, UK



In 2017, we have secured a contract with Severn Trent Water to design and implement three Actiflo® Turbo high performance water clarifiers at the Frankley Water Treatment Works as part of the Birmingham Resilience scheme. This compact, high flow rate water clarification solution uses patented technology to offer the capacity to process 312 million litres of water a day.





# ACTIFLO® Carb

## Optimum treatment for natural organic matter and micropollutants

Designed to treat and refine water, **ACTIFLO® Carb** combines the fast flocculation and sedimentation performance of Actiflo® with the adsorption capacity of Powdered Activated Carbon (PAC) to eliminate substances resistant to the clarification process.

### APPLICATIONS

- For municipalities and industries
- Drinking water: for the treatment of non-flocculable Natural Organic Matter (NOM), pesticides, emerging micropollutants, micro-algae, odors
- Process water: for refining and treating resistant NOM
- Sewage: to eliminate hard Chemical Oxygen Demand (COD) and other compounds resistant to chemical or biological treatment
- “Reuse”: for the advanced tertiary treatment and refinement of treated sewage

### PERFORMANCES

- Advanced Powdered Activated Carbon treatment
- Maximum elimination of NOM and emerging micropollutants (removal of up to 95%)
- Polishing of the treated water
- High sedimentation speed:  $\geq 30$  m/h

### BENEFITS

- Compatible with other clarification processes upstream: Actiflo®, Multiflo™, Spidflow®
- Using Hydrex Biosourced flocculants
- Small footprint
- Simple to commission: start-up in a few minutes
- Easy, low-cost upgrading of existing installations

### REFERENCES

**Nantes Métropole, France**

- 160,000 m<sup>3</sup>/day



**DSM Nutritional Products, Village-Neuf, France**

- 2,400 m<sup>3</sup>/day

**Fuyang, Zhejiang, China**

- 250,000 m<sup>3</sup>/day



**Harpeth Valley, Nashville, USA**

- 90,000 m<sup>3</sup>/day



**TW Moses, Indianapolis, USA**

- 91,000 m<sup>3</sup>/day

**Raffineria di Millazo, Italy**

- 7,200 m<sup>3</sup>/day





# FILTRAFLO™ Carb

## *The next generation polishing technology*

A chemical-free polishing solution, **FILTRAFLO™ Carb** uses a recyclable activated carbon in microgranules to eliminate by adsorption natural organic matter, pesticides, and other micropollutants in treated water while also filtering it.

### APPLICATIONS

- For small to medium-size facilities
- Upgrading of existing drinking water plants
- Groundwater first treatment step with low turbidity water
- Surface water after flotation or settling
- Wastewater tertiary polishing treatment

### PERFORMANCES

- Combines physical filtration of suspended solids with adsorption of organic matter using innovative reusable activated carbon in microgranules

- Stable performance
- Flexible design using concrete, metal or plastic (HDPE)
- Adaptability to variations in contaminants

### BENEFITS

- Easy to operate
- Compact and modular
- Low-energy consumption
- No activated carbon sludge to treat (savings)

### REFERENCES

**Filtraflo™ Carb has already been implanted on several municipal sites in the west of France.**

#### **Craon, France**

- 80 m<sup>3</sup>/hr

#### **Fouet Barrégant, France)**

- 100 m<sup>3</sup>/hr

#### **La Française DWTP, France**

- 250 m<sup>3</sup>/hr





# ANOXKALDNES™ MBBR

## *The next generation polishing technology*

### EXPERTISE

- 1000+ references Worldwide
- 30+ years of experience
- +27 years, longest plant in operation-with original AnoxKaldnes media
- References in municipal and most industrial sectors

### CUSTOMIZED FOR YOU

- Biological expertise allows AnoxKaldnes to find the best solution to fit your needs
- For BOD/COD and nitrogen removal
- But also for complex compounds like pharmaceuticals, EDTA, Selenium and Phenols
- Side stream and mainstream anammox solutions

### ADVANTAGES

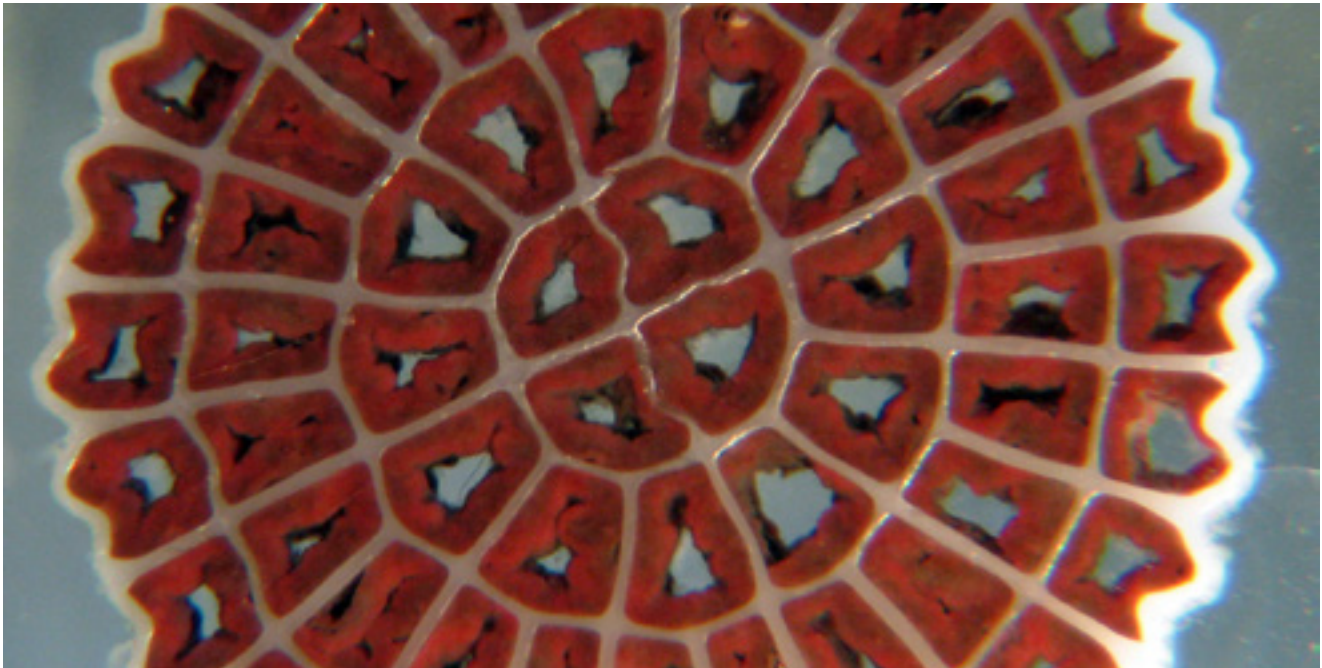
- Biofilm expertise applied using MBBR technology
- Retrofit and Increase Capacity
- Compact Footprint
- Robust and Tolerant
- Flexible Configurations

### REFERENCES



#### Heathrow Airport, UK

VWT UK has been awarded a contract to design, build and operate a new wastewater treatment plant for Heathrow Airport. During the cold weather months, glycol is used for de-icing the planes and in order to ensure compliance with new discharge consents applied by the environmental regulator, Heathrow needs a treatment solution to improve the quality of the wastewater that is discharged. At the core of the wastewater treatment plant is our AnoxKaldnes MBBR and Hydrotech Discfilter technology. AK MBBR technology is also used at Oslo airport to treat de-icer. However at Oslo this de-icer is combined with municipal wastewater and during the summer months the plant is operated on municipal wastewater alone. As a result, given that the Heathrow plant will be operated solely on de-icer and only during the cold weather months, this will be the first plant of its type globally.



# ANITA™ Mox

## The cost-effective ammonia removal solution

With an ammonia removal efficiency of over 80% with no use of external carbon source and at a very low energy cost, **ANITA™ Mox** is well suited to efficiently reduce the operating cost and improve the environmental record of a wastewater treatment plant.

### APPLICATIONS

ANITA™ Mox is specially developed for the treatment of streams highly loaded in ammonia such as:

- Reject water following anaerobic digestion from municipal WWTP to reduce the nitrogen load on the main wastewater treatment line
- Industrial wastewaters, especially after anaerobic treatment and landfill leachates

### BENEFITS

- No carbon source needed
- Compact process
- Almost 60% oxygen savings
- Reduced sludge production
- Robust process
- Stable process
- Lower CO<sub>2</sub> emissions

### REFERENCES

#### Denver Colorado, USA

- Operating since 2017
- Treating municipal digestate
- 3000 kg N/day



#### Gothenburg (Gryaab), Sweden

- Operating since 2018
- Treating municipal digestate
- >1000 kg N/day



#### Osberstown, Ireland

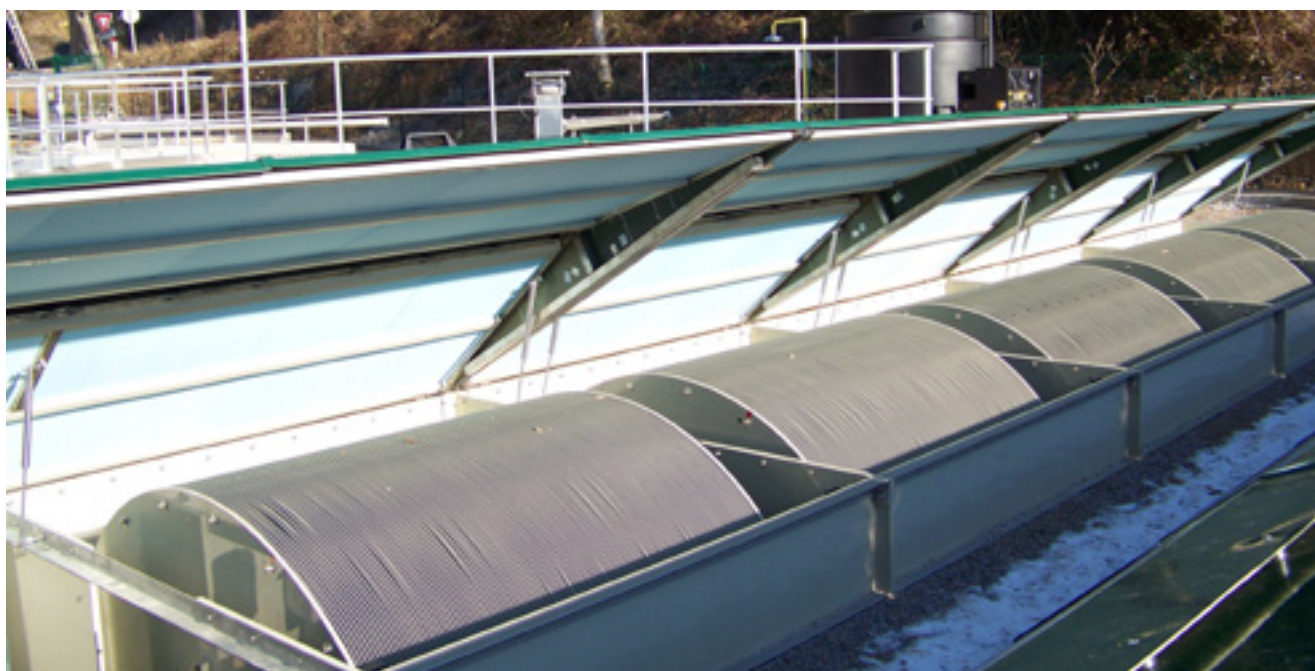
- Treating municipal THP digestate
- Start-up 2018
- 600 kg N/day



#### Five Fords (Wales), UK

- Treating municipal THP digestate
- Start-up 2018
- 775 kg N/day





# ECODISK™

## The ecological solution for local wastewater treatment plants

*Effluent treatment of small and medium communities requires economical and easy to operate systems which are not sensitive to organic and hydraulic load variations. Ecodisk is the ecological solution for local wastewater treatment plants, from 100 to 10,000 population equivalent.*

### PRODUCTS

- Packaged biological plants
- NEW Ecodisk Denit for TN treatment
- DEVELOPMENT Ecodisk Solar for autonomous installations

### APPLICATIONS

- Ideal design for wastewater treatment in small and medium-sized communities
- Compact solutions for decentralized treatment (living base, hotel, industrial complex)

### PERFORMANCES

- Modular and upgradeable process integrated into the environment

- Process adaptable to load and hydraulic variations
- Complete treatment of wastewater
- Reliability of the set culture
- Worldwide experience with more than 1,000 reference plants
- Reliable, recyclable and durable process

### BENEFITS

- Low energy consumption
- Expansion and rehabilitation of existing plants
- Small footprint
- Simple and minimal operation

### REFERENCES

#### Königswalde, Germany

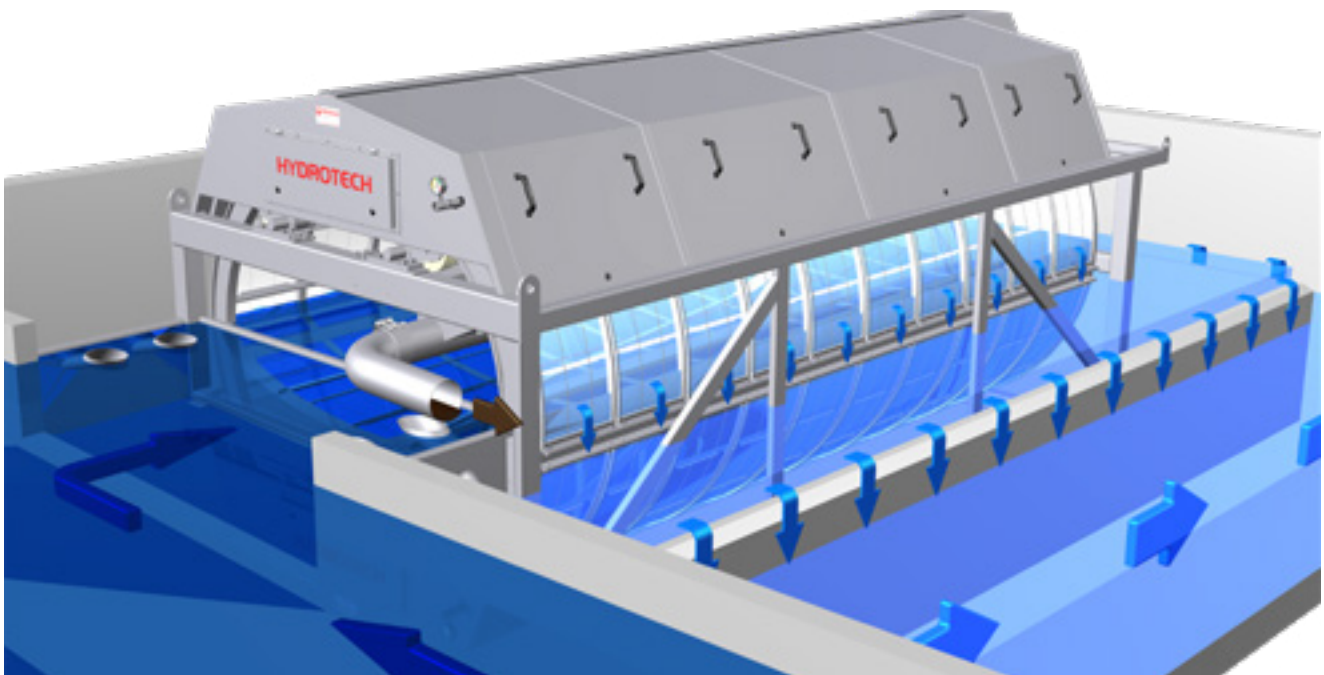


- Connection size: 2,200 inhabitant equivalents
- Restoration of a worn rotational body system by replacing the rotating body by rotating biological disks with a diameter of 3.7 m and an area of 2 x 5,540 m<sup>2</sup> in an existing concrete tank.

#### Imi Ouaddar Resort, Morocco



- Connection size: 5,350 inhabitant equivalents
- Beautifully integrated into the coastline, the treatment process includes a bar screen, settler digester, four Ecodisk units, a Hydrotech drumfilter and a UV system to reuse the treated water.



# HYDROTECH FILTERS

## *Boost your primary filtration*

*A successful wastewater treatment starts at the beginning. Hydrotech filters offers great flexibility in terms of possibilities of controlling the loading (TSS, BOD, COD and P) to the biological treatment downstream. The efficiency of primary sludge removal by filtration will also maximize the possibilities for energy production by digestion.*

### BENEFITS

#### Proven technology

With more than 10 years experience and with successful references for the primary treatment application, Hydrotech filter is considered as a proven technology.

#### Small footprint

Compared to conventional primary clarifiers the Hydrotech filters only require 20 % of the footprint. With chemicals added upstream even less footprint is required.

#### Boost your plant with the Hydrotech Plug and Play units

- Upgrade and retrofit your current WWTP
- Minimize the effects of your seasonal loading variations
- Improve your storm water or CSO treatment
- Flexibility to control the filtration efficiency by usage of on-line chemical dosing to fulfil your specific requirements

### REFERENCES

#### Stavanger primary filtration, Norway



- The Central Wastewater Treatment Plant of Nord Jæren (SNJ) in the city of Stavanger, located on the south-west coast of Norway.
- Primary treatment upgrade by using Hydrotech filters.

#### Key figures

- 500,000 population equivalent
- 2 800 l/s
- 300 mgTSS/l / 33000kgTSS/d
- 20 Hydrotech Drumfilters model HDF2010

#### The Benefits

- Reducing aeration volume and aeration demand in downstream biological treatment
- Smaller footprint
- Odor control
- Increasing energy recovery in the digeste

# BIOETHANE

*Leading anaerobic technologies for industrial effluent treatment and municipal sludge treatment*

## BIOBED® ADVANCED EGSB

### Proven technology

Extremely compact, high performance process for industrial effluents using granular sludge.

- Pressurized & gastight concept
- Up to >95% COD removal, with loading rates up to 15-25kg/m<sup>3</sup>/day
- A highly stable technology for a great variety of industries
- Large net energy production by biogas recovery
- Low sludge production and very low energy consumption

### Memthane®

Memthane® is an Anaerobic Membrane Bio-Reactor (AnMBR) which maximizes renewable energy production while producing superb quality effluent that can be reused or discharged directly to sewer.

- Excellent permeate quality
  - > 98% COD & BOD removal
  - > Secondary treatment effluent quality
  - > Crystal clear & Base for water re-use
- Robust = 100% Biomass retention = no biomass wash out
  - > Biomass is retained through Ultra Filtration not through settling
  - > High tolerance for FOG and TSS
- Lower overall CAPEX and OPEX
  - > Saving of pre- and post-treatment
  - > 3 processes in 1

- Overall high yield on biogas production
  - > Intake load higher through skipping of pre-treatment unit
  - > Degradation of FOG and TSS
- Simplified process

### MemGas™

Biogas upgrading

- Low Methane slip (loss) of less than < 0,5% leads to Methane yield of more than 99%
- High purity of the CO<sub>2</sub> in the OFF-Gas (> 99%)
- Low electrical power consumption (< 0,3 – 0,4 kWhel / m<sup>3</sup> Biogas)
- Surplus compressor heat available for the digester (0,3 kWhth/m<sup>3</sup> Biogas)
- No chemicals needed

### SMART Biogas Management

To increase the ease, reliability and effectiveness of the operation of anaerobic wastewater treatment plants AQUAVISTA™ Plant has been developed. The technology provides a new dimension in operating anaerobic granular wastewater treatment process through 24/7 real-time control. This allows for minimal physical operational attendance. This technology consists of a carefully designed instrumentation and control package. It measures online quality parameters: water flow, COD reduction, biogas production

and biomass quality. The system is provided with automated 24/7 backup service - 365 days per year. This innovation is expected to change the regular operation of biological wastewater treatment plants into automated selfregulating plants, which are monitored remotely.

## REFERENCES

### Arla, Aylesbury, Buckinghamshire, United Kingdom

- World's first zero-carbon milk processing facility using cutting edge renewable energy solutions.
- Technology: Memthane® anaerobic membrane bioreactor (combination of the advantages of anaerobic treatment with external crossflow filtration).
- Treatment of 500 m<sup>3</sup>/d of wastewater containing 5 tCOD/d.

### Paulaner Brewery, Munich, Germany

- Paulaner built a new greenfield brewery with special emphasis on modern and environmentally friendly brewery technology as well as an energy- and emission-optimised infrastructure.
- Technology: Biobed® Advanced EGSB
- Treatment of 2,800 m<sup>3</sup>/d of wastewater containing 23,5 tCOD/d. The biogas produced is used to produce energy in the boiler house on site.





# EXELYS™

## Reduce sludge thanks to a continuous thermal hydrolysis process

**EXELYS™** is an innovative and complete sludge reduction solution that works in continuous mode, combining thermal hydrolysis and anaerobic digestion.

### APPLICATIONS

Exelys™ handles industrial or municipal sludge and can also handle grease.

### PERFORMANCES

- Up to 25 to 35% less dry solids
- Up to 30 to 50% more biogas
- Improve sludge quality
- No odors
- Improve sludge quality for land application

### BENEFITS

- Continuous 24 hour a day operation
- Simplified operation & maintenance
- Limited footprint
- Reduced investment and operating costs
- Increased existing digestion capacity
- Generated income

### REFERENCES

#### Billund BioRefinery, Denmark

- 130,000 population equivalent
- 5,200 tDS / year



#### Versailles, France

- 330,000 population equivalent
- 9,300 tDS / year



#### Marquette-lez-Lille, France

- 620,000 population equivalent
- 25,000 tDS / year



#### Ljubljana, Slovenia

- 572,000 population equivalent
- 14,600 tDS/year
- Partial LD Configuration



#### Yeosu, Korea

- 140,000 population equivalent
- 3,500 tDS/year
- LD configuration



#### Osberstown, Ireland

- 360,000 population equivalent
- 9,190 tDS/year
- LD configuration





# BIO THELYS™

## Batch thermal hydrolysis

*Bio Thelys™ is a complete sludge reduction solution that works in batch mode, combining thermal hydrolysis and anaerobic digestion.*

### PERFORMANCES

By coupling thermal hydrolysis with anaerobic digestion, BioThelys offers a better performance than conventional digestion and optimises sludge treatment by producing:

- 25 to 35% less dry solids
- 30 to 50% more biogas
- No odors
- A safe, high quality product for land application.

Bio Thelys is able to process a wide range of organic, industrial or municipal sludges, including those containing fats, oils and grease (FOG).

### BENEFITS

- Produces a pasteurised digestate that is compliant with international standards e.g. EPA Class A (USA), ADAS Safe Sludge Matrix (UK)
- Reduced digester-related investment for new installations
- An increased digestion facility allows for more sludge to be processed, even at existing facilities
- Reduced operating costs
  - > Improved sludge dewaterability saves on chemical costs
  - > Reduced sludge volume provide savings on the transport
- Income is generated from:
  - > Ability to process imported organic materials for codigestion.
  - > Selling the energy produced from co-generation or biomethan

### REFERENCES

#### Bonneuil, France

- 261,000 PE\*
- 5,720 tDS/year\*\*
- Partial LD configuration

#### Ginestous, France

- 500,000 PE\*
- 12,600 tDS/year\*\*
- Partial LD configuration

#### Esholt, United Kingdom

- 2,100,000 PE
- 32,800 tDS/year\*\*
- LD configuration

#### Oxford, United Kingdom

- 1,400,000 PE
- 26,000 tDS/year
- LD configuration

#### Monza, Italy

- 750,000 PE
- 10,200 tDS/year\*\*
- LD configuration

\*PE: Population Equivalent adjusted to inlet sludge capacity.  
\*\*Including imported sludge.





## GAS TOP

*New and innovative digester design with patented Gas Top. Krüger, a Veolia Water Technologies subsidiary, has developed a new digester design with the main purpose of reducing operating costs as well as capital costs and at the same time improve the digestion.*

### FEATURES

- Construction with a flat-roof and no headspace in the concrete part of the digester which results in a reduction of the capital costs. The design simplifies the construction and reduces the risk of corrosion of the concrete surface in an acidic environment inside the digester.
- Integrated gas cooler (Gas Top) that improves the gas quality, reduces foam overflow, and acts as flame arrester.
- Built-in cleaning and maintenance possibilities, i.e. cleaning of blocked pipes, removal of sand and grit during operation, safe maintenance of the mixer and no shutdown of the digester. All improvements increase the operational reliability and reduce the costs related to operation and maintenance.

### BENEFITS

- Simplified operation and maintenance
- Removal of sand and floating sludge
- Reduced foam formation
- Reduced operating and capital costs
- Improved performance
- Improved biogas quality
- Reliable solution, incl. ATEX
- Safe working environment

### REFERENCES

#### **Yeosu STP, South Korea**

- 2 digesters x 1,500 m<sup>3</sup>
- Mesophilic operation



#### **Lynetten WWTP, Denmark**

- 2 digesters x 6,000 m<sup>3</sup>
- Thermophilic operation



#### **Zhengzhou New Area sludge digestion, China**

- 6 digesters x 12,700 m
- Mesophilic operation



#### **Limassol WWTP, Cyprus**

- 2 digesters x 3,000 m
- Mesophilic operation





# BIOCO™

## Sludge drying, incineration & energy optimisation

The **BioCo™** dryer treats municipal dewatered sludge within a safe environment for the operator.

### APPLICATIONS

Municipal dewatered sludge Low temperature treatment for low energy plants


### PERFORMANCES

- Safe operation due to low drying temperature
- Delivers disinfected and granulated dried biosolids
- Low operation and maintenance costs
- Meets Class A requirement
- Energy recovery
- Low carbon footprint


### BENEFITS


- Safe, simple & efficient operation
- Customised end product
- Self-cleaning nozzles
- No dust
- Air tight
- No odors

### REFERENCES

**Marquette-lez-Lille (France)**   
 • 620,000 population equivalent  
 • 3.6 tons / hour


**Rosny-sur-Seine (France)**  
 • 142,000 population equivalent  
 • 1.7 tons / hour

**Lagares Vigo (Spain)**   
 • 800 000 population equivalent  
 • 3,8 tons / hour

**Juneau (USA)**   
 • 200 000 population equivalent  
 • 3 tons / hour

**Legnica (Poland)**   
 • 100 000 population equivalent  
 • 1,3 ton / hour

**Pomorzany (Poland)**  
 • 420,000 population equivalent  
 • 2 tons / hour

**BioCo SDL:**  
**Cagnes (France)**   
 • 160 000 population equivalent  
 • 2,1 ton / hour



# OLEIS

## *New sludge conditioning system for dewatering improvement*

### APPLICATIONS

- Sludge type: primary, secondary and digested sludge.
- Sludge flow: 10 – 35 m<sup>3</sup>/h
- Footprint: 2.9 m (L) x 1.5 m (W) x 1.9 m (H)

### BENEFITS

#### • Improvement of dry (DS) concentration

The Oleis sludge pre-treatment solution enables an average increase of the DS by 1.5% - 2% points after the centrifuges. Any increase in the DS concentration will be a benefit to a plant operator, as it reduces the volume of sludge to be deposited, thus reducing the

disposal costs. For a designer, it will be a benefit, because it is possible to reduce the size of downstream equipment (i.e. dryer, incinerator, thermal hydrolysis, etc.), improve its energy and consequently its operating costs.

#### • Protection of the centrifuge

The Oleis is equipped with a shredder that reduces the particle size, therefore it also helps to protect the centrifuge from large fibers.

#### • Easy operation

Oleis is a stand-alone skid that does not need any interaction with the other treatment steps in the WWTP. The operator will

simply start up the Oleis from the local solids interface, after having started the centrifuge. However, if an automatic start is requested, it can be connected to the WWTP's overall control system. The Oleis is designed to be a safe plug-in unit. Due to the unique design with a very short retention time and automatic emptying of the tank there is no risk of gas production. Gas accumulation is avoided by safe ventilation.

#### • Minimum maintenance

The Oleis requires minimum maintenance.



# SOLIA™ Mix

## The new generation of solar sludge drying

As a pioneer and expert in solar sludge drying, Veolia Water Technologies has developed innovative solutions such as **SOLIA™ Mix**. This new and more compact process can achieve a dry solids content up to 90%, reducing sludge volume and removal costs.

Mainly dedicated to small and mid-sized municipalities and industries, SOLIA™ Mix opens the way to all outlet disposal routes: agricultural reuse, composting, landfill, incineration and co-incineration.

### APPLICATIONS

- Mainly dedicated to small and mid-sized municipalities and industries
- All outlet disposal routes: agricultural reuse, composting, landfill, incineration and co-incineration

### PERFORMANCES

- A dry solids content up to 85%
- Sludge volume reduced by 3 to 4 times
- A low carbon footprint process
- Sludge storage before reuse

### BENEFITS

- Reliable and robust
- Fully automated process operation
- Uses renewable energy sources
- Odor control
- Aesthetic and easily integrated architecture

### REFERENCES

#### Bras-Panon, Réunion Island, France

- 204 TDM/year
- 680 m<sup>2</sup>

#### Saint-Michel-en-L'Herm, France

- 120 TDM/year
- 300 m<sup>2</sup>

#### Pia, France

- 242 TDM/year
- 947 m<sup>2</sup>

#### Belchatow, Poland

- 1850 TDM/year
- 6,144 m<sup>2</sup>

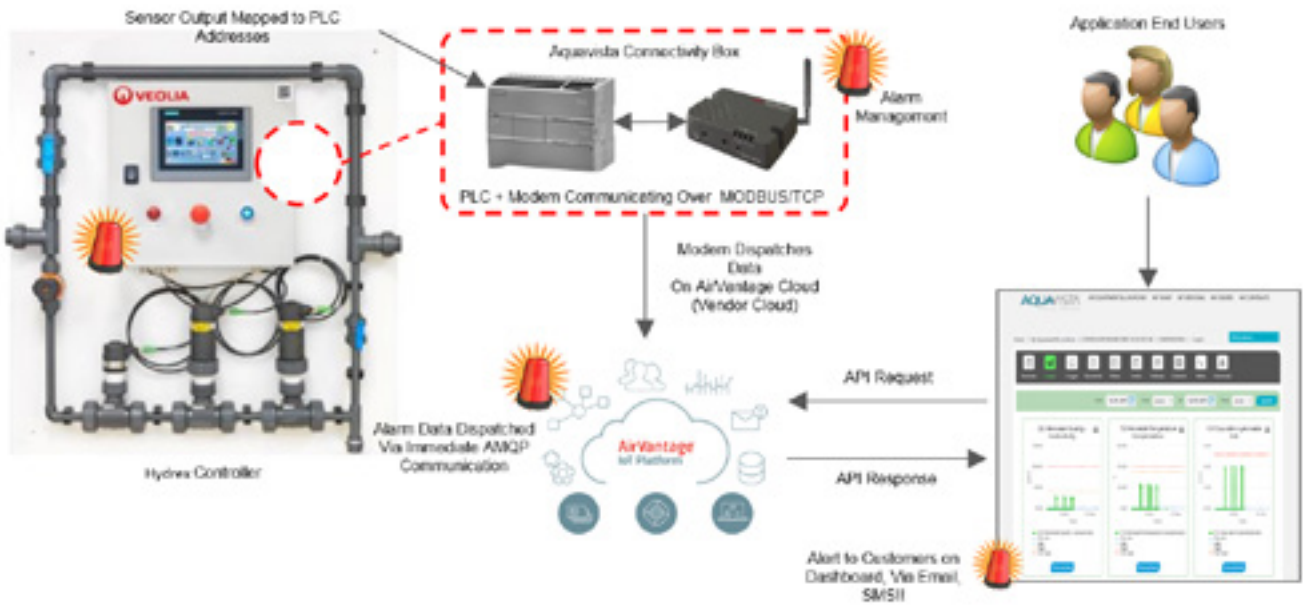




# Did you know that **HYDREX™** covers all your water treatment chemical needs?

Veolia Water Technologies provides a **full range of water treatment additives but also associated services** (technical assistance and audit onsite + support of Hydrex experts' team) and **equipment** such as dosing systems and tanks. You can also take advantage of our **AQUAVISTA™ monitoring** / digital tools and on-line scanners to ensure better performance of the treatment. If you need water treatment chemical assistance, Hydrex™ has the solution!

- Boiler Water Treatment Products ➤ HYDREX 1000 SERIES
- Cooling Water Treatment Products ➤ HYDREX 2000 SERIES
- Drinking Water Treatment Products ➤ HYDREX 3000 SERIES
- Membrane Treatment Products ➤ HYDREX 4000 SERIES
- Maintenance and Cleaning Products ➤ HYDREX 5000 SERIES
- Wastewater Treatment Products ➤ HYDREX 6000 SERIES
- Biocides Products ➤ HYDREX 7000 SERIES
- Industrial Application Products ➤ HYDREX 8000 SERIES
- Thermal Desalination, bulk chemicals & Others ➤ HYDREX 9000 SERIES



# Mobile Water Services

***Delivering water anywhere, 24/7. Ideal for planned hire, emergencies and disaster***

**Our Mobile Water Services** provide pure water anytime, anywhere, 24 hours a day, 7 days a week. With flow rates from 200 litres/hr to >150 m<sup>3</sup>/hr, our Mobile Water Services are ideal for planned hire, emergency call-outs and disaster recovery. Safeguarding the production of your water treatment plant, our Mobile Water Services provide flexible water services, while reducing your wastewater discharge volume and identifying reuse opportunities.

## EMERGENCY MOBILE WATER SERVICES

This high-value service has been developed to protect and provide your business with 'treated water security' in the event of an unplanned circumstance where you require a temporary water treatment plant. We can deploy equipment and engineers within four hours of your call 24/7, and can deliver any quality and quantity of treated water for an unlimited time period, in a safe and responsible way.

## PLANNED MOBILE WATER SERVICES

This 'customer choice' planned service provides customised, flexible and adaptable solutions for your foreseen requirements for temporary water treatment. This service provides capabilities, technologies and engineers who deliver treated water of any quality and quantity in the most cost-effective way, during open-ended usage periods and meeting the highest service standards.

## MULTI-YEAR MOBILE WATER SERVICES

Our multi-year service provides reliable, cost-effective and adaptable solutions to meet and exceed your long-term requirements for treated water. This service provides tried and tested standard equipment, capabilities, technologies and engineers who deliver treated water to industry standards, meeting and exceeding quality and quantity requirements in a secure, responsible and sustainable way.

Multi-year services are available over defined time periods, typically between one and ten years, to match your needs.

## REFERENCE

### James Paget Hospital, UK

The renal ward at James Paget Hospital operates 16 hours each day, and accommodates up to 18 patients at any one time for three hour sessions. To support this critical activity, James Paget needed to upgrade their existing water treatment system.

Veolia Water Technologies's carbon analysis team assessed the carbon footprint of the existing system and compared various options for the new system. The recommended solution comprised of a Modula SXL hygienic reverse osmosis unit and a nephro SAFE heat sanitisable ultrafiltration unit. The project has provided James Paget Hospital with a new renal water system to meet its current and planned needs, and a reduced carbon footprint. ●





# AQUA service plant audit

**Decades of experience in the building** and operation of water treatment plants is the basis for the development of our plant audit.

You are the expert when it comes to your technologies, products and services. You modify your processes based on the customers' requirements. But what about your water treatment? How much does the purification and disposal of your wastewater cost? Is the water quality sustainable? How high is the energy and chemicals consumption? How can risks be minimised and health protection be optimised? How often is maintenance required? Can you run your plant more efficiently? What would the budget be for necessary investments?

## AIMS OF THE PLANT AUDIT

- Long-term operational safety
- Lowering operating costs
- Increasing the plant output
- Legal certainty
- Resource-minimizing operation

## EFFICIENCY IN FOUR STEPS

### 1 Initial discussion

- Definition of the requirements, first plant inspection
- Review of the documents
- Detailed offer for AQUA service plant audit

### 2 Kick-off

- Inventory of performance data and plant design
- Recording of measurement and operating data, water analysis

### 3 Report

- Plant status with operational recommendations
- Economic perspective of ways to optimize the plant
- Legal/technical limitations and risk analysis

### 4 Summary

- Evaluation of the findings
- Recommendation of options for optimisation

## BENEFITS

- Long-term operational safety
- Lowering operating costs
- Increasing the plant output
- Legal certainty
- Resource-minimising operation



# *Innovative Water Solutions*



## **WATER TECHNOLOGIES**

Through its innovative solutions, Veolia Water Technologies enables industry, local authorities and citizens to optimize their use of resources for more efficient, environmentally-friendly and socially responsible outcomes.

We understand the importance of increasing the value of water and we do so by supplying high quality water, treating and reusing wastewater, producing and/or recovering energy, extracting raw materials and capitalizing on valuable byproducts.

[www.veoliawatertechnologies.com](http://www.veoliawatertechnologies.com)

Resourcing the world



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