WWEM
2018 *like a glimpse into the future*

WWEM Exhibition

WWEM Conference

WWEM Workshop

With visitor levels up by 19% WWEM 2018 has been hailed a major success following November's event in Telford.

"Visitors commented that a visit to WWEM is like looking into the future of the water sector," reports organiser Marcus Pattison.

"Most of the Conferences and Workshops focused on new, smart, innovative methods of testing and monitoring – both in the field and in the lab, and visitors were able to meet the people behind these innovations and the issues that drive them."

Marcus Pattison
WWEM Organiser

Apprentice Competition

Apprentice Competition

Apprentice Winners

"WWEM 2018 was an experiment, in that it was run concurrently with AQE 2018, the Air Quality & Emissions event, and we were delighted with the synergy that this created – visitors were able to pass freely between the two events and it was great to see around 80% of them taking advantage of this" said Marcus Pattison, WWEM Organiser.

The main purpose of the WWEM events, which began in 2005, is to provide the latest information on the regulations, standards, methods and technologies that relate to the testing and monitoring of water and wastewater. This is achieved with a comprehensive programme of Conferences and Workshops supported by a major international exhibition. By bringing the whole sector together, including laboratory, online and field monitoring, the WWEM events provide a unique learning opportunity. As a focused event, visitors are able to meet regulators, accreditation organisations, members of Standards committees, academics, researchers, method developers, instrumentation experts and a wide variety of monitoring practitioners with environmental responsibilities.

Mat Jackson, Principal Flood Risk Manager at West Sussex County Council, provided feedback on WWEM 2018 that was typical of the event's visitors: "A fantastic opportunity to network, experience first-hand innovative techniques in monitoring, as well as gaining an update on sector knowledge." Charles Fairclough, Senior M&E Buyer at Wessex Water Services agreed: "Great opportunity to catch up with a large number of our current suppliers all in one place, and to engage with potential new ones, as well as networking with people from other water utilities and industries."

Bill Dove, Operations Manager at e2mltd was more succinct. He said: "If you work in water, be there." Ilaria Frau, a PhD student at Liverpool John Moores University, said: "It is an amazing opportunity to network with companies and to see the latest technologies related to water and wastewater monitoring."

SCA CONFERENCE

An analytical conference was organised by the Standing Committee of Analysts (SCA). Prof K Clive Thompson described the history of the SCA and outlined future potential. An impressive list of eminent and highly experienced speakers then addressed some of the most topical analytical issues. In addition to sampling and information requirements, the presentations covered issues such as the analysis of inorganics and metals, as well as the stability and uncertainty in organics analysis. The chemical analysis of soils and associated materials was discussed by Hazel Davidson. The evolution of drinking water microbiology was then described, in addition to the role of on-line water quality monitoring in the production of high quality tap water.

Visitor Jennifer Hough, a Team Leader from Dwr Cymru Welsh Water, said: "I found the exhibition very useful; being able to see new and improved technology all in one place. There was a huge variety of exhibitors which meant there was something relevant to every aspect of my work. I also enjoyed the conference greatly. I met several people from the SCA and got a chance to hear about what is happening in that area currently and in the future. Overall it was a day well spent."

ANALYTICAL CONFERENCE

Many of the hottest topics in this sector were addressed, including on-line and at-site analysis, as well as the detection, counting and monitoring of microplastics. Potential solutions

were described by Dr Andrew Mayes from the University of East Anglia, and Dr Claire Gwinnett from the University of Staffordshire. Further presentations addressed analysis in common environmental applications including, for example, real-time aquifer monitoring for shale oil and gas extraction. Improved and novel analytical solutions were described including automated on-line monitoring for laboratory-grade monitoring of pollutants, and buoys fitted with smart sensors. Some of the new analytical techniques being covered included ion selective field effect transistors, on-site spectrometry, droplet-based microfluidic sensors, trace analysis of engineered silver nanomaterials, simple techniques for N and P with TOC, and the measurement of 5-day BOD in just 48 hours.

Oliver Grievson, Executive Director of WIPAC (Water Industry Process Automation & Control), the LinkedIn Group, was heavily involved with the organisation of several parts of WWEM 2018. WIPAC started in May 2011 and now has a dedicated following of almost 7,700. Following the success of the group, WIPAC was formally launched as a membership organisation at WWEM 2018.

> ## "A fantastic opportunity to network, experience first-hand innovative techniques in monitoring, as well as gaining an update on sector knowledge."

Key WIPAC activities at WWEM included the Learning Zone Workshops, the Instrumentation Apprentice Competition and the WIPAC Flow Forum. The Instrumentation Apprentice Competition was split into three rounds with the first round setting the apprentices problem scenarios to solve b y engaging with the supply chain so that practical and technical issues could be addressed.

The second practical round involved tests set by a number of the sponsors. These included problem solving on the Siris Environmental Flow rig, setting up a pumping station on the Siemens pump station controllers, Bluetooth setup of instrumentation with Vega as well as working with water quality instrumentation from both ABB and Partech.

The third round was a quick-fire quiz, managed by Andy Godley from WRc, which tested everything that the teams of apprentices had learned throughout the day. The competition was tightly fought with Natalie Oliver and Dan Calvert from Yorkshire Water emerging as winners, and Alex Ward and Chris McGhee from United Utilities coming a close second. As winners of the competition, Natalie and Dan will be invited to a variety of training seminars.

The WIPAC Flow Forum was split into three main areas including: the maintenance of flow structures; the control of wastewater flows, and new technologies in flow measurement. The first session started with Marc Swain of Severn Trent Water who discussed the importance of maintaining primary measurement devices. He highlighted the problems that Water Companies face with large numbers of sites and assets. The second presentation moved from the maintenance of sensors to the maintenance of the asset base. Craig Handford and

Sepideh Sobhdam of Morrison Utilities highlighted some of the projects that they deliver and some of the challenges they have faced. The last presentation of the first session was given by Steven French of Z-Tech Control Systems who explained the importance of installing sensors in the correct place; ensuring that they are secure and protected from the environment. The second session concentrated on the control of wastewater flows which in England and Wales is becoming increasingly important with the current event duration monitoring programme in place to identify where there are problem CSO's.

The second session, presented by Claire Fenwick Managing Director of nuron, addressed the monitoring of the gravity sewer with new technologies. She described the potential of fibre optic cables for communicating in the sewer environment, and as a sensing system for a variety of parameters such as flow, level, temperature and pipe condition. The technique has been developed by the University of Sheffield and is at the trial stage with Northumbrian Water. The third speaker in the second session, Lorenzo Pompa of Anglian Water, described flow monitoring, automatic pump reversal and pressure monitoring within the pumped wastewater network allowing for enhanced visualisation and operation of the network.

The last session of the Flow Forum concentrated on technological developments in flow technology and started with Rob Stevens of RS Hydro, who discussed developments in Time of Flight ultrasonic flow monitoring. This led on to a presentation by Dr Andy Nichols from the University of Sheffield on 'Free Surface Flow Measurement' using various techniques ranging from acoustics using modified mobile phone sensors, microwaves, and visual techniques including Microsoft's Kinetic device. In the final presentation Greg Wainhouse of Burkert Fluid Control Systems showed a technique that has been adapted for use in the wastewater industry. The Surface Acoustic Wave (SAW) technology has the potential to be used in a similar fashion to Coriolis in that it can be used to measure mass flow such as in sludge processes.

The Pump Centre Conference was entitled: 'Delivering BIM - Using Product Data across the UK Water Industry for Enhanced Efficiencies in Capital Delivery and Asset Management.' As the UK water industry increasingly embraces BIM Level 2 during AMP 6 and AMP 7, there will be an increasing need for bespoke water industry product data templates. These will allow manufacturers to transfer product information in a digital format and in turn allow owner operators to directly import vital product information into their asset management system. This conference provided an insight in to how this process works and what data templates have been created.

One of the WWEM sessions featured the Engineering Futures Launch Initiative which was created to help micro and small businesses to attract apprentices; providing an affordable brokering service to partner enterprises with local schools, colleges and universities. Effectively under the scheme, Engineering Futures becomes an extension to each micro or SME compiling and presenting on behalf of each company, thereby substantially increasing their chances of attracting the right candidates.

A comprehensive programme of Workshops ran throughout the event, offering visitors the chance to receive free training on a wide variety of topics. This included the WIPAC Learning Zone which focused on:

• Flow Measurement

• Level, Pressure & Aeration Systems

• Measuring Water Quality

• Communications

Pulsar Award

Brian Blessed

ATi Metrinet

A PROFIBUS Workshop was also available - organised by PI UK, an organisation which promotes the use of PROFIBUS in the UK. More recently it has added PROFINET and IO-Link to the range of technologies supported by the group and is now known as PROFIBUS and PROFINET International UK, or PI UK for short.

A SWAN Workshop (Smart Water Networks Forum) brought together key players to collaborate and accelerate the use of data-driven solutions in water and wastewater networks. Visitors to this workshop: gained insights on the most pressing water service challenges; learned about the latest, integrated smart water and wastewater solutions; heard real-life water company case studies and engaged with water company and industry leaders through interactive roundtables.

The WMSOC Conference was entitled Rapid Microbiology Practical Applications. Organised by the Water Management Society, this conference provided the latest advice on testing for Legionella and other water-borne pathogens. The speakers shared their experience in testing and monitoring techniques as well as outbreak management, with real-world case studies.

WWEM ANALYTICAL CONFERENCE

Prof Gary Fones from Portsmouth University, described the use of a passive sampler for monitoring pollutants such as herbicides in rivers. He explained the disadvantages of spot sampling and the analytical limitations of field instrumentation, and described applications for deriving time-weighted average concentrations with 'Chemcatcher.' In addition to herbicides Gary also described applications including pharmaceuticals such as Ibruprofen and pesticides such as Metaldehyde. This was followed by a presentation on automated sample preparation and GC-TOF for SVOC and pesticide analysis.

Organised by the Environmental and Food Analysis Special Interest Group (EFASIG) of the BMSS, the presentations also addressed the screening of wastewater. Speakers covered recent advances in Ion Chromatography, Mass Spectrometry and online monitoring of VOCs from waste effluent by GC-FID and GC-TOF MS. Advanced deconvolution tools were described for improved GC/MS identification rates.

Many common pharmaceuticals are not biodegraded during wastewater treatment and can bioaccumulate through adsorption to soils and sludge, and Dr Ruth Godfery from Swansea University described novel techniques for screening pharmaceutical and other medicinal compounds within environmental samples. Finally, a method was described for the rapid measurement of FOG (Fat, Oil and Grease) from wastewater using bench-top NMR.

Taste and odour challenges were also addressed, with a description of the world's most sensitive detector, and then speakers from IME, University of Chicago provided a very interesting description of a 'cyberphysical' sensing system in India monitoring high frequency temporal and spatial variation in river water quality parameters.

SWIG CONFERENCE

The Sensors for Water Interest Group (SWIG) organised a conference that ran on the second day. Rosa Richards, Programme Manager for SWIG, reports on two highly successful sessions covering 'Industrial discharge monitoring' and 'Smart water: extracting value and insights from data.'

The EA relies on fracking operators to undertake regulatory monitoring of groundwater, but the EA's Lucy Snape explained that audits and inspections are undertaken before, during and after operations. Site visits are also undertaken by partners of the EA from the Health and Safety Executive and from the oil and gas industry. Companies carrying out fracking are prohibited from using hazardous substances in the fluid injected into the ground, and the EA monitors groundwater to check for compliance.

With the majority of people visiting both events, and numbers up by 19% we are clearly making it easier for people to find the information they need," comments organiser Marcus Pattison

Matt Dibbs from Meteor Communications explained how remote water quality monitoring with real-time communications is transforming the management of both water resources and wastewater. With requirements for rapid deployment, low power, unattended reliable operation and real-time access to data, Meteor Communications has developed systems, with customers such as the Environment Agency and Thames Water, to meet these needs. ESNET (Environmental Sensor NETwork) systems are now deployed all over the UK, collecting data from Xylem EXO sondes as well as other sensors for flow, level, phosphate and meteorological parameters, which add contextual information to the water quality data. Matt explained the advantages of these systems over traditional final effluent monitors which can be costly and time consuming to install with on-site civil engineering etc.

Matt further explained how Meteor Communications can also deliver 'water quality as a service' by installing and operating the monitors. The systems are provided on flexible lease agreements, which means that no capital investment is required. Equipment can be deployed within 24 hours and live data available within 30 minutes of installation. Meteor staff visit monitoring sites on a scheduled basis; swapping the water quality sonde so that it can be calibrated in a controlled laboratory environment. This is extremely cost effective, and each calibration produces a certificate, which provides an audit trail.

Martin Croft from Dynamic Flow Technologies described the first wastewater flow monitor to be accredited with MCERTS. This non-contact flow monitor can measure partially full, gravity-fed pipes. The monitor includes an automatic sampler and readings are accurate to 0.1mm. Results are displayed on a dashboard which enables customers to select dates/ times to view, and it is possible to set alarms. Trade effluent is usually charged according to clean water consumption but by

measuring wastewater flow, companies can demonstrate real data and reduce the cost of their licence, whilst identifying the main sources of flow. Martin presented a food manufacturer case study which demonstrated a 28% saving on the water bill. Market research by Dynamic Flow Technologies suggests that at least 20,000 businesses in the UK could benefit from a wastewater flow meter.

Kieran Williams from Environmental Monitoring Solutions described a system for active discharge control which combines artificial intelligence using fuzzy logic with an autonomous control system. The CENTAUR system enables management of urban drainage networks to reduce wastewater flooding events. By controlling the use of flood gates in the urban drainage network, wastewater can be stored to use the available capacity in the network, and Kieran described successful applications in Portugal and France.

In the afternoon, Garry Tabor from ATi explained how smart water networks are well within reach, and emphasised that a willingness to work together will be vital to the ability of the UK water sector to embrace digitisation successfully. Laurie Reynolds then explained how the various technologies can work together to give a digitally controlled dispersed water reuse system. Laurie described decentralised facilities which reuse grey water for all uses except drinking. Pumps, dosing system and control valves are all controlled using the IoT and cloud-based solutions.

Steve Hanslow and John Gaffney of Siemens presented the Siemens Mindsphere platform as a viable, secure platform to allow connectivity of the hardware needed to embrace the IoT and take the first steps towards smart water. John demonstrated how multiple data sets from different sensors and different locations are being used to tackle the real-world issues associated with service reservoirs in the distribution system. The presentation showed how terabytes of data can be used to deliver a small number of actionable insights that will improve water quality and reduce operating costs.

In the final SWIG presentation, Jez Downs of Southern Water described aspirations for a water distribution network completely controlled by AI by the end of 2035. Southern Water has a large scale water quality sensor deployment in its distribution network. Jez explained how these sensors are delivering value to Southern Water, playing a vital role on the journey toward a smart water network. Summarising, Mike Strahand said that the themes of transparency and collaboration ran through all of the presentations, with supply chains, water companies and competitors all working together for the benefit of everyone.

INTERNATIONAL EXHIBITION

The WWEM 2018 Exhibition featured organisations from around the world, offering an opportunity to see the whole sector in one place, with almost 150 stands representing more than 300 of the world's leading providers of testing, analysis and monitoring equipment, and related services.

There were many new exhibitors at WWEM 2018, significantly expanding the range of technologies on offer. Many of the stands featured novel AI and IOT products and solutions.

A wide range of new products and technologies were launched at the event and feedback from exhibitors was overwhelmingly positive. The OTT Hydromet stand, for example, was busy throughout the event. MD Nigel Grimsley said: "Nutrient

monitoring was the main theme of our stand and workshop. We launched the new OTT ecoN at WWEM - as an optical sensor it has been designed for long term deployment in nitrate monitoring applications, and as such makes an ideal accompaniment to the Hydrocycle PO4 phosphate monitor. Nutrients are a major concern in lowland rivers and other water resources, so these products were of great interest to regulators, water companies, researchers and consultants."

Similarly, Matt Dibbs of Meteor Communications said: "We were delighted to meet so many existing users and also with the high level of interest from visitors in general. The ability to set up the portable, modular ESNET water quality monitoring stations and have live data on the web in just a few minutes at sites with no existing power supply or data connection, was greatly appreciated by a broad spectrum of visitors."

HACH also enjoyed a highly successful event with John Moroney reporting particularly high levels of interest in the new HACH EZ Series continuous water quality analysers, and HACH's Mobile Sensor Management system which improves alignment and verification between lab and process instruments.

Neal Edmondson from GRUNDFOS said: "2018 was our first visit to WWEM. We were delighted with the number of people there; the quality of the conversations we had and the opportunities to network etc. We will definitely be back in 2020." Tom Lendrem from PMA agreed: "WWEM 2018 was the best yet for PMA. Lots of interest in P removal and network monitoring solutions. We're looking forward to 2020!"

The SEAL Analytical stand featured a number of laboratory products that had not been seen in the UK market before. These include the AA500 autoanalyser – a segmented flow analyser with a very small footprint but with remarkable performance for tests such as cyanide and phenol. The AA500 also featured in SEAL's workshop on lab automation, presented by Senior Technical Support Chemist Niamh Cronin, who explained the advantages of automation including efficiency, work rate and safety. WWEM also provided SEAL with an opportunity to display the enormous capabilities of the Rohasys range of laboratory automation equipment for tests such as BOD, COD, pH and conductivity.

Harry Threlfall from Detectronic summed up the exhibition nicely: "As an exhibitor we always hope to be able to speak with many relevant people from many different areas of the water industry. The exhibition certainly allowed us to do that as well providing a great way to learn about the new technologies and approaches being used across the waste water industry."

A Gala Dinner for both AQE and WWEM took place on the evening of 21st November, with Brian Blessed as the after dinner speaker. The winners of various competitions were announced, including the WRc Instrument User Group awards. The Group's members include Thames Water, Severn Trent Water, Northumbrian Water, Dwr Cymru Welsh Water, United Utilities, South West Water and Anglian Water. The best after sales service award was presented to Pulsar who were judged to go above and beyond others in providing service and support to their customers.

The breakthrough product award recognises the supplier/ manufacturer of a new instrumentation solution. The product must be commercially available and used in the UK. It should have clear benefits over existing approaches which could be technical, performance, cost or maintenance. The runners up were as follows:

• PPM low flow final effluent turbidity system

• RS hydro laserflow

• PMA S3 colourimeter

• Sigrist BactoSense

The winner was ATi Metrinet which was seen as an innovation with the potential to radically change how water companies monitor water quality in the distribution network. ATi Managing Director Mike Strahand was delighted with the award, adding: "WWEM is the perfect size and location; the UK water sector's number one event of the year."

2020 VISION

By co-locating WWEM and AQE, the 2018 event was able to exploit the synergy that exists between both sides of environmental monitoring, whilst maintaining the events' focus on testing and monitoring. "With the majority of people visiting both events, and numbers up by 19% we are clearly making it easier for people to find the information they need," comments organiser Marcus Pattison. "We will therefore run the two events together again on 11th and 12th November 2020 – please add the dates to your diary!"

Marcus Pattison
WWEM Organiser

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Compact, universal and reliable water leak detection

Hermann Sewerin's Aquaphon® is a water leak detection system without rival. The A 150 receiver together with the market-tested microphone technology of the AQUAPHON® A 200 system allows professional prelocation and the precise pinpointing of leaks. The receiver's clever, compact design and maximum carrying comfort are star qualities. Connected to high-end microphones and wireless headphones, the A 150 impresses with its brilliant reproduction quality. In addition, noises are visualised on the display so that they can be reliably and uniquely evaluated. Thanks to adjustable filters and automatic frequency scanning, frequency ranges can be individually adapted to the user's hearing. Influences from sound interference are minimised, and the sound quality is optimised for reliable evaluation of the leak situation.

Its practical dimensions and light weight make the compact A 150 receiver perfect for everyday use. Instead of using the carrying strap, it can also be conveniently clipped onto the wearer's belt. For users this means effortless carrying and greater freedom of movement, as there is nothing to get in the way of leak detection! One of the particularly practical features is the display with its optimised tilt angle, which makes it consistently easy to read. The screen automatically rotates 180° depending on how it is carried. The TS 150carrying rod offers maximum convenience and speed when it comes to changing the microphone. The AQUAPHON® A 150 can be effortlessly adapted to all kinds of conditions and requirements.

The A 150 receiver is designed for prelocation along fittings or pinpointing on different surfaces – either outdoors or in buildings. Measurements can be started or terminated using the activation key. Current and previous minimum noise levels are shown both as a graph and a numerical readout on the practical display. Volume, filter limits and hearing-protection can be adjusted to the hearing of the individual user to optimum effect.

The high-quality piezo microphones feature a frequency response especially optimised for leak detection. Digital signal processing also offers excellent acoustic properties. Thanks to the excellent sound quality and minimisation of sound interference, you can reliably identify and locate leaks, even if the sound intensity of the leak is weak or there is significant ambient noise.

AQUAPHON® A 150 – automatic microphone recognition with the new carrying rod TS150

The AQUAPHON® A 150receiver automatically calculates the filters and selects suitable frequency ranges. Alternatively, you can set manual filter limits according to your individual hearing and select frequency ranges which accentuate the leak noise. The powerful rechargeable battery also guarantees maximum availability without recharging for at least two working days.

The TM 200touch microphone has been specially developed for prelocation along fittings in the pipe network. Its frequency response allows the reliable detection of muted and low-pitched noises, as tend to occur on plastic pipes. But it also reliably plays back loud and high-pitched leak noises on metal pipelines.

The probe tip and different extensions ensure optimum adjustment to structural conditions in all pipe networks. The TM 200features a torch function, which is automatically activated on the AQUAPHON® A 150for secure positioning on key rods, for example in dark slide gate covers.

The UM 200microphone for picking up structure-borne noise features a very wide frequency response and is extremely sensitive in the low frequency range. This makes the UM 200perfect for recording even the quietest noises, particularly on plastic pipes. The cable is extremely robust and can withstand heavy mechanical loads. This guarantees a very long service life in daily use, even under the harshest of conditions.
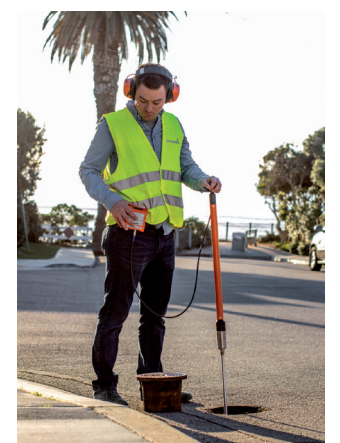
The BM 200 ground microphone is ideal for paved surfaces. The robust housing is detached from the actual microphone capsule for optimum effect. A lifting mechanism ensures consistently perfect contact with the ground so that small surface bumps no longer affect results.

The BM 230 ground microphone is ideal for unpaved surfaces. The solid tripod ensures a consistently secure position. If the ground is particularly soft, an extra spike can be screwed in to ensure even better noise transmission.

A star knob and the sturdy form-fitted holder create a secure connection between the microphones and the T 150carrying rod. The sensor interface on the carrying rod reliably detects the various microphones. The TS 150can, therefore, perform the two roles for which a special test rod and the carrying rod for ground microphones were previously required. It records the relevant microphones depending on the application. The TS 150does not need to be charged. The microphones are powered by a high-performance rechargeable battery in the A 150 receiver, which guarantees operation for at least 16 hours.

The system case offers sufficient space to safely hold all components of the system. Both the receiver and the F8wireless headphones can be simultaneously charged. Charging equipment is available for the measuring vehicle as well as the workshop or office.

The AQUAPHON® A 150fits seamlessly into the AQUAPHON® SYSTEM product family, offering a third option for electro-acoustic water leak detection between the Aquaphon® A 50and the AQUAPHON® A 200.

For More Info, email: 47223pr@reply-direct.com