



# Operational innovation



**Capital Markets Day**  
28 September 2021

# Leading the way in UK water



## Purpose-led business

– pioneering a new relationship with customers and protecting the environment

## Driving performance through innovation

– agile and efficient

## Investing for sustainable growth – for the benefit of all

– twin track strategy;  
organic, acquisitive

## Creating long-term sustainable value



# Innovation embedded in our every day operations

**South West Water has a strong track record of embracing change and innovation to deliver benefits for customers and shareholders alike**

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Within our operations, innovation has been central to delivering service improvements whilst keeping costs down

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Innovation is becoming even more important for the water sector to meet the challenges of population growth, changing demographics, increasing costs, climate change, and future talent and skills

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Building on our strong platform of delivering service efficiently, we are deploying new technology and innovation in order to support a resilient future

Operational innovation in practice

# Innovation Centre for Resilience, Environment, Water and Waste

**More than ever, science is playing a significant role in our research and development**

Working with the University of Exeter we have developed our Innovation Centre for Resilience, Environment, Water and Waste

All of our innovation, research and development is being piloted through this research facility (including Ofwat innovation competition successful bids)

Collaborating to develop solutions to some of the most pressing industry challenges

The new facility incorporates state of the art laboratory facilities and designated spaces to encourage collaborative research between academics, experts from the water industry and SMEs

UNIVERSITY OF  
**EXETER** | Centre for Resilience  
Environment, Water and Waste



Operational innovation in practice

# Piloting approach to new technology and ways of working

Partnering with the University of Exeter to establish a UK Innovation Centre for Resilience, Environment, Water and Waste



Global innovation networks focused on water quality – strategic alliance with Singapore Public Utilities Board and PWN

UK First of its kind water treatment works using SIX®, ILCA<sup>(1)</sup> and ceramic membrane technology



Ceramic SIX® filters, Mayflower Water Treatment Works

First UK deployment of EZ valves – allowing burst repair to be undertaken live under pressure, minimising supply interruptions

Utilising satellite scanning and thermal signature variations and deployment of ‘lift and shift’ and fixed network acoustic loggers to improve leak detection and repair capability



AVT EZ Valve system

Artificial intelligence CCTV surveys reducing need for manual review

‘Zeta’ robotics enabling efficient laboratory analysis and chemical use



Operational innovation in practice

# Wastewater treatment innovation to improve resilience

To manage the risks of rapid growth in our region additional Hybrid Activated Sludge Process Tanks 'HYBACS' have been successfully trialled during recent summer periods

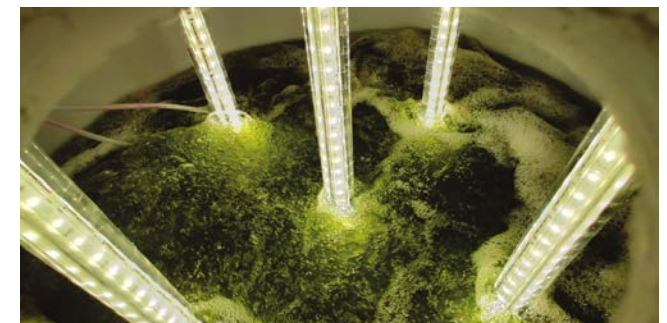
Significant costs avoided and treatment capacity able to flex to meet exceptional demands in Newquay over the summer

Pioneering the use of HYBACS as a Phosphorous removal stream – early research results suggests this is possible at Newquay operation

One of first adopters of I-Phyc's algae-based treatment to sustainably remove Phosphorus and micro-pollutants from wastewater

I-Phyc is able to consistently remove between 50% and 99% of these pollutants and utilises a natural process using algae to biologically treat wastewater

Delivering sustainable low cost solutions for smaller treatment catchments



Operational innovation in practice

# Predicting potential pollutions

## Meniscus



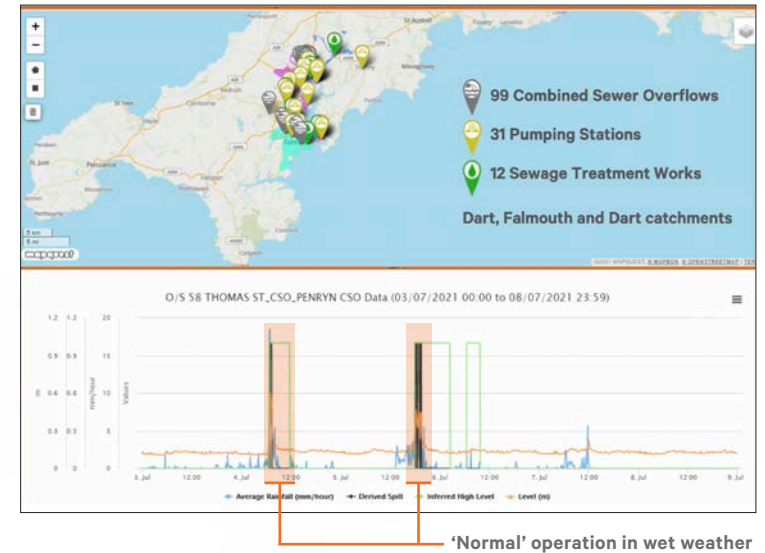
Researched different solutions to analyse data from telemetry across our infrastructure

Piloted AI solution, Meniscus, in one of our regions to test whether pollutions could be predicted more accurately

AI links asset data to weather forecasts providing a predictive approach to identifying potential pollution risk

Test results validated concept – now rolled out across our regions

Data analytics is being used to provide timely and accurate operational intelligence to prevent pollution incidents



Operational innovation in practice

# CCTV artificial intelligence

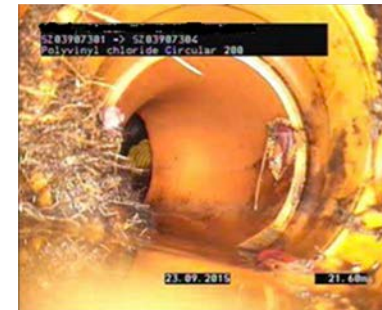
Asset conditions and deterioration are difficult to ascertain in a consistent, accurate and timely manner

South West Water have collaborated with Exeter University to develop AI to automate sewer condition surveys

Enables the detection and coding of faults accurately and efficiently

Removes need for extensive manual review of CCTV surveys, decreasing the time taken to identify issues for resolution

Early piloting encouraging – further development and piloting required before potential full roll out



Intruding roots



Settled deposits



Collapsed pipe

Operational innovation in practice

# Leakage reduction

## Lift & shift and fixed network acoustic loggers

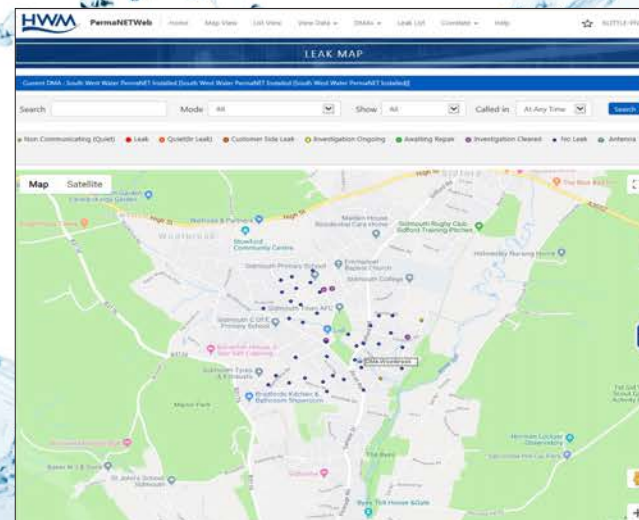
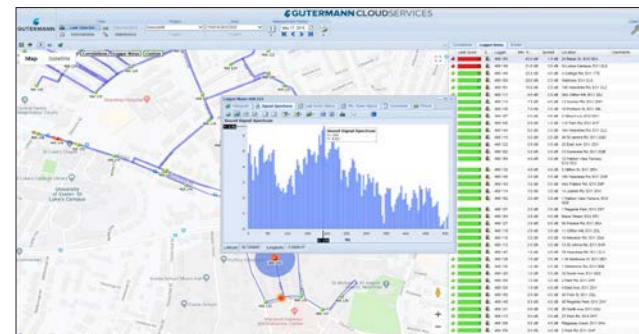
Piloted 'lift and shift' acoustic loggers and fixed point network acoustic loggers

After successful pilots rolled our extensively across our region

Data driven leak detection enables much more precise targeting of leaks

AI over time learns further improving accuracy of identification of leaks further

Alarms sent directly to teams for investigation



Operational innovation in practice

# Satellite scanning and thermal signatures

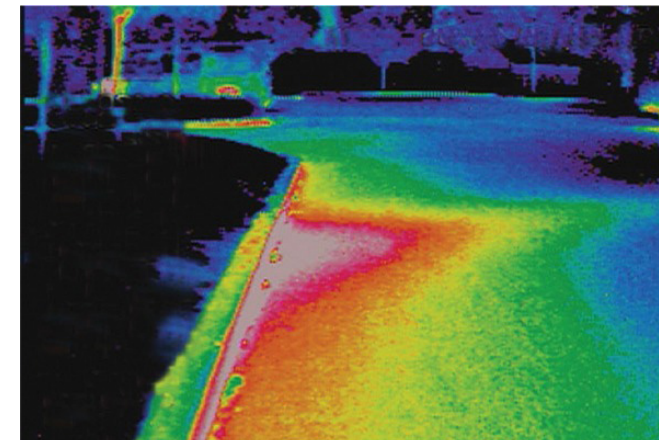
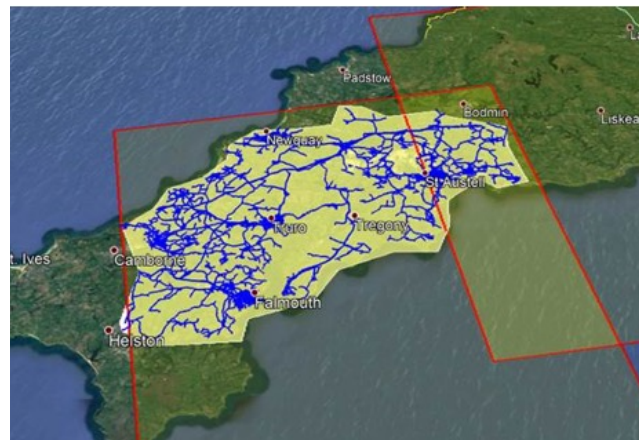
Trialled use of satellite imaging to identify leaks

AI used to isolate characteristics of escaping water

High percentage strike rate of leaks identified

Now rolled out across our entire region

Quarterly snapshots now used to supplement other leak detection methods e.g. use of thermal drones



Operational innovation in practice

# Minimising supply interruptions

## EZ valves

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Collaborated with Advanced Valve Technologies to pilot EZ Valves

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Enabled live burst repairs to be undertaken, ensuring no interrupted supplies to customers

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First UK company to deploy innovative EZ Valves across operation

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Significantly reduced interruptions to customers including zero planned interruptions



Operational innovation in practice

# Building on Mayflower success and the importance of global research alliances

Fundamental knowledge of ceramic membranes accelerated our progress into pilot trials for the new Bournemouth facilities

Our pioneering track record meant we were utility of choice for the first UK trials of an emerging ceramic membrane technology

Piloting new membrane alongside the one at Mayflower – driven competition

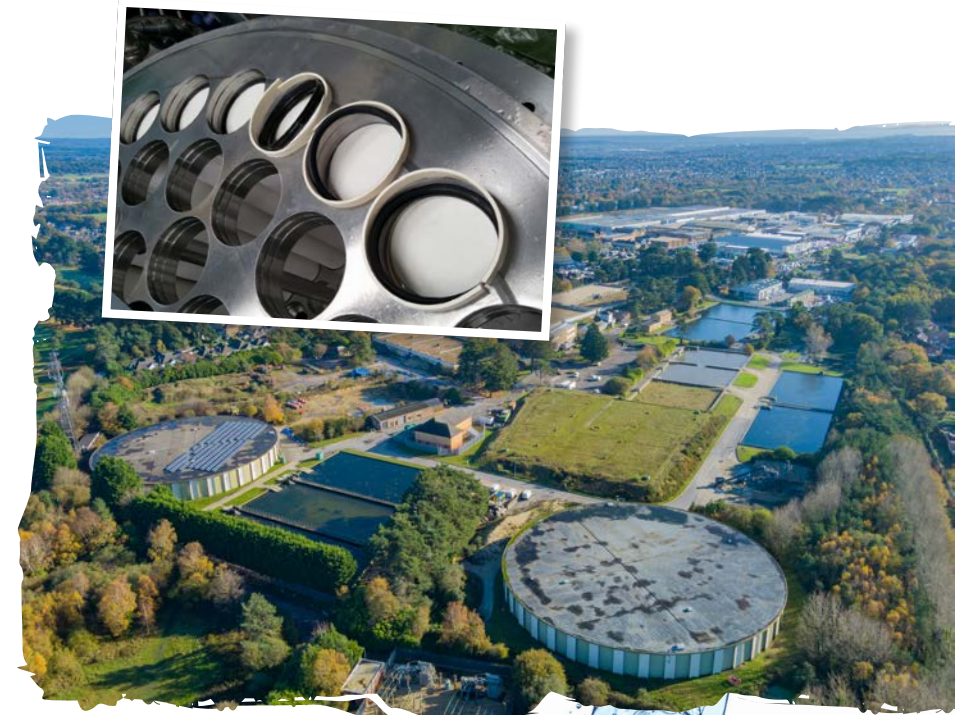
Early pilot results providing assurance over improved water quality, reduced footprint and cost

Global research alliances with leading utilities such as Singapore PUB, PWN, DeWatergroup, academia and technology providers continue to provide shared insight in water industry challenges

**c.£135m replacement**  
of our two strategic Water Treatment Works in the Bournemouth region

Up to  
**170 regional jobs created**

Water quality  
**improvements for**  
**c.160,000 customers**



Operational innovation in practice

# Optimising chemical processes

## ZETA

Early adopter of Zeta measurement to establish if this novel approach could enhance the efficiency of our existing processes

Pilot trials established 30% saving in coagulant required and much more stable process operation giving us confidence to explore more automated deployment

Now pioneering a fully automated system through collaboration with the technology provider alongside Singapore PUB and PWN<sup>(1)</sup>

Further research goal to establish if coupling the approach with machine learning may bring wider application opportunities



Operational innovation in practice

# Laboratory automation and robotics

## Leading edge robotic technology

Leading edge robotic technology trialled in our micro-pollutant laboratory to miniaturise sample volumes and automate sample preparation

Successfully automated the complex analysis of cryptosporidium

This innovation has increased laboratory analytical capacity, reduced cross contamination risks and improved compliance

Exploring the use of further state of the art robotics in conjunction with Exeter University to see if these provide further opportunities



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# Q&A



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