High Efficiency Batch RO for N & P Removal EWWM Conference

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PROCESS SOLUTIONS®

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Introduction

- Current challenges and opportunity
- Current solutions
- HyBatch[™] RO
 - an alternative solution
 - what's in the box?
- Pilot trial results
- Next steps
- Summary





Industry Challenges

- Tightening P consents
- Higher capital investment and higher dependency on chemicals
- Nature-based-solutions are not always feasible due to footprint and cost and take several years to establish
- Water scarcity, reuse required, emerging contaminants
- 86% of rivers not good
- ~900 schemes in AMP8





Opportunity

- HyBatch[™] RO as alternative to conventional solutions to P (&N) removal
- Future-proofing (e.g. N and emerging contaminants)
- Reduce chemicals
- Reduce waste volume
- Reduce infrastructure





Solution

- HyBatch[™] RO to extract P from existing wastewater treatment plant effluents, thereby preventing nutrients from entering the environment
- No requirement for ferric or aluminium dosing
- At least 95% recovery
- Typically 50% lower energy
- Modular, scalable, rapid deployment, low volume of waste
- Speed of deployment ("plug and play")
- Modular





Solution







HyBatch[™] System

Conventional RO systems are built by multiple water engineering service providers, using generic designs and components. Semi-batch designs improve performance. Salinity's patented HyBatch™ RO halves the energy used.



HyBatch[™] System

Salinity's high efficiency HyBatch™ RO uses a pressure exchange vessel and patented valve control to minimise the pressure in the system, more than halving the energy required.



Somerset Trial – Summer 2023

- Within 24h
- 99% P removal
- 88% N removal
- 13A plug
- Up to 95% recovery







Trial performance – 99% P removal





Trial performance – 88% N removal







Next steps

- Long-term pilot end 2024
- Develop supply chain
- Scale and standardise product
 - Pre-treatment integration
- Engage with industry partners
 - Wastewater
 - Water reuse
 - Mineral recovery
 - ZLD





Summary

- HyBatch[™] makes RO viable:
 - 95% recovery
 - 50% lower energy
 - Plug and play
 - 98% P removal









Questions





