

CASE STUDY

Phosphorus Reduction Using the Soneco® System: Experience from a Wessex Water Site

Leading UK water and sewage company implements sustainable alternative to liquid

About Wessex Water

Wessex Water serves 2.9 million customers across the South West of England. The company is committed to improving river and coastal water quality, reducing nutrient pollution in sensitive catchments, and achieving net zero operational carbon by 2030.

About Power & Water

Power & Water is a UK water-technology company specialising in enhanced sono-electrocoagulation for advanced water and wastewater treatment. The Soneco system generates coagulant on site using metal plates, helping utilities reduce chemical use, lower carbon and simplify day-to-day operations.

Visit our website to find out more: powerandwater.com

THE ISSUE

Phosphorus is a naturally occurring nutrient, but when too much enters rivers it accelerates eutrophication – excessive algal and plant growth that depletes dissolved oxygen and damages aquatic habitats.

Phosphorus reduction is vital to meeting Wessex Water's environmental goals and regulatory commitments. In England, excess phosphorus is the leading reason rivers fail to achieve 'good' ecological status, and reducing it delivers one of the fastest measurable improvements in river health.

Government analysis* shows that 60–70% of the phosphorus load driving ecological failure comes from treated wastewater discharges, making wastewater treatment works a critical point of intervention. The Piddlehinton Sewage Treatment Works, for example, discharges into the Poole Harbour where elevated nutrient levels are a known issue.

THE CHALLENGE

Traditional phosphorus removal at small sites typically involves liquid-chemical dosing. While effective, this approach is carbon-energy-and chemically-intensive. It requires chemical storage, bunding, safety showers, pH adjustment, and frequent heavy goods vehicle deliveries – increasing operational burden and embodied carbon.

With supply chain uncertainty and rising manufacturing emissions associated with chemical production, reliance on delivered chemicals presents both financial and operational risk.

To comply with the Water Framework Directive, the EU law that aims to protect and improve the quality of all water bodies, Wessex Water required a reliable solution capable of consistently meeting a ≤ 1 mg/L phosphorus consent with a residual iron limit < 4 mg/L.

THE SOLUTION

Wessex Water selected Soneco®, Power & Water's enhanced electrocoagulation system.

Electrocoagulation works through controlled dissolution of the metal plates into the surrounding water, forming coagulants that precipitates phosphorus so it can be removed through solids separation. Instead of delivered chemicals, Soneco® generates coagulant on-site using metal plates.

Soneco® further enhances this process using targeted ultrasound, improving coagulation efficiency and reducing operational cost compared to standard electrocoagulation systems.

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SONECO® IMPACT AT WESSEX WATER

Operational Performance & Efficiency

Automated phosphorus dosing with on-site coagulant generation; ~90% of alarms resolved remotely; full SCADA visibility; plates swapped ~every 40 days; accurate dosing through system automation based on incoming load.

Environmental Protection & Compliance

Consistent phosphorus and iron compliance in a nutrient-sensitive catchment; no liquid-chemical storage, bunding or pH-correction infrastructure; reduces spill risk on a site with limited access and a history of flooding.

Net Zero & Sustainability

Eliminates delivered chemicals and associated heavy-goods vehicle movements; lowers embodied and operational carbon (modelled -82% and -51%); supports Wessex Water's 2030 net-zero operational emissions target.

Health & Safety

Eliminates potable-water/safety-shower requirements; no bulk-chemical handling or exposure risk for operators; simplifies operations without increasing on-site risk.

THE SOLUTION

Because the process maintains stable pH, it eliminates the need for additional pH correction chemicals and the associated storage infrastructure.

In this case, the compact, skid-mounted Soneco® system was delivered assembled and moved into place on skates due to restricted access – a practical approach well suited to rural sites. Metal plates are stored on site and swapped approximately every 40 days, eliminating tanker deliveries entirely.

To streamline ongoing management, Soneco integrates directly into Wessex Water's existing SCADA/telemetry system, providing full visibility and alarms through the standard interface.

RESULTS

Measure	Target / Previous	Result
Phosphorus (P)	< 1 mg/L	Confirmed
Residual iron	< 4 mg/L	Confirmed
Chemical deliveries	Weekly — Eliminated	~40-day plate change**
Alarm handling	—	~90% resolved remotely
Embodied carbon	—	-82%***
Operational carbon	—	-51%***

** Based on frequency of plate changes

*** From an independent assessment conducted by MBB and based on a medium sized utility site.

OPERATIONAL INSIGHT

"For many utilities, the challenge is increasingly to do more with less. By cutting out chemicals, lowering carbon, and reducing the operational load on already-stretched teams, Soneco® offers a more sustainable and straightforward way to run small and rural sites while still delivering the performance they need."

— Mike Rattenbury, COO, Power & Water