Power & Water

CASE STUDY

Industrial Water Reuse Using the Soneco® System

About Power & Water

Power & Water is a UK water technology company specialising in enhanced electrocoagulation for advanced water and waste water treatment. The patented Soneco® system generates coagulant on site using metal plates, enabling controlled coagulation and solids separation without liquid chemical dosing. Systems are configured to suit site-specific water chemistry and operational requirements and are equipped with in-line monitoring to enable automated influent-responding control.

Visit our website to find out more: **powerandwater.com**

COMMERCIAL MODEL

The Soneco® is available under a Hardware-as-a-Service (HAAS) model, providing flexible, subscription-style access without the need for upfront capital investment. This approach allows operators to deploy the technology quickly, scale as needed and benefit from operational support, maintenance, and performance guarantees while converting water treatment into a predictable, manageable operating cost.

Industrial sites often generate water streams outside the main process - such as filter press permeate, runoff and wash water - that are difficult to manage. These streams can be highly variable, making consistent treatment and reuse challenging using chemical dosing alone.

Rising water costs, increasing environmental regulation, and tighter enforcement of discharge limits are putting additional pressure on operators to manage water responsibly while limiting chemicals and controlling operating costs. Treating and reusing water on-site not only reduces the volume of freshwater required, but also helps mitigate environmental risks, improve operational effciency and support sustainability targets.

Across aggregates recycling and cement production, Power & Water's Soneco® system has been deployed as a chemical-reducing treatment step (lowering CO^2 footprint as a result) that operates reliably under real site conditions. Soneco® technology handles shock loads well, unlike conventional chemical or biologically driven solutions, enabling practical, circular waste reuse across industrial operations.

This is demonstrated in the following two case studies, — one in aggregates recycling and one in cement production — showing real operational results, performance gains and water reuse outcomes.

CASE STUDY

Gavin Griffiths Aggregates Recycling Site

The Gavin Griffiths Group operates an aggregates recycling site at Cwmgwili, Wales where incoming material is washed and processed into reusable sand and stone products, generating water streams with high levels of fine clays and silt.

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THE CHALLENGE

While chemical dosing allowed the site to meet discharge limits, inconsistent water quality prevented reuse and reduced the scope for lowering freshwater use and associated costs.

There was also ongoing environmental risk associated with runoff and discharge to a nearby watercourse, particularly during periods of heavy rainfall when lagoon levels and water quality could change rapidly.

The goal was to move towards a genuinely circular recycle-and-reuse approach, aligned with the Washed Aggregates Trade Association's (WATA) focus on improving water reuse and reducing environmental risk across the sector.

IMPACT

Reuse & Water Efficiency
Treated filter press permeate, lagoon runoff and other washwater can be reused, lowering freshwater demand and associated costs.

Environmental Protection & Compliance
Eliminates handling and spill risk, while stable treated water supports safe discharge during high-rainfall events.

Cost & Commercial Performance
The trial demonstrated near cost-neutral operation through reduced mains water use and lower chemical consumption.

THE SOLUTION

A modular Soneco® DB1 sono-electrochemical treatment unit was installed to treat filter press permeate (selected deliberately as the most challenging water stream on site).

It showed wide variation in suspended solids, turbidity and dissolved constituents, including metals and fluctuating pH, adding significant complexity to treatment.

The Soneco® unit was integrated into existing site infrastructure and commissioned as a dedicated treatment step for this stream, operating continuously with smart process control and delivering stable performance as influent conditions varied.

Runoff lagoon water was also treated through the system during the trial, demonstrating that heavily silted water could be brought to a quality suitable for reuse within site operations.

RESULTS

During commissioning and early operation, the system delivered clear and repeatable performance improvements through smart process control under variable influent conditions, achieving treated water quality suitable for reuse:

- **Turbidity: reduced from approximately 250–400 NTU to consistently below 20–25 NTU**
- **Suspended solids: reduced from approximately 177 mg/L to around 18 mg/L**

Time-series turbidity data showed stable treatment performance over time, even as incoming water quality fluctuated due to weather and operational changes.

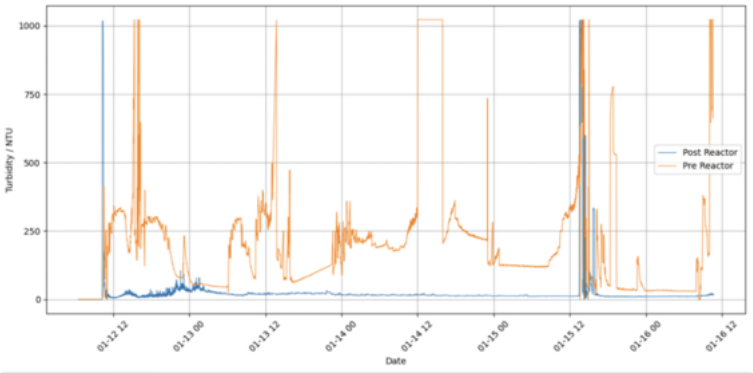

Figure: Turbidity time-series showing highly variable influent conditions and consistently low treated effluent turbidity (<20 NTU) over the operational period.

"Operationally, Soneco has delivered consistent results. Once it was up and running, we saw steady performance, which gave us confidence in how we manage water reuse and discharge on a day to day basis. We've also seen an impact on water costs through being able to reuse clean water back into the process."

Jake Stephens, Operations Director, Gavin Griffiths Group.

CASE STUDY

Hanson Cement (Heidelberg Materials)

Hanson runs a large cement and aggregates processing site where water treatment has to work reliably as part of continuous production. Alongside suspended solids and turbidity, process water contains cement-related constituents, which makes reuse and discharge harder to manage day to day.

THE CHALLENGE

With increasing pressure to reduce chemical use and improve water efficiency, the site needed a treatment step that could run continuously and behave predictably in a tough industrial environment - without adding complexity for operators or disrupting production.

THE SOLUTION

Soneco® was integrated into the existing water management system as a continuous, chemical-reducing treatment step. Configured for the site's specific water chemistry, the system runs automatically within the process and maintains stable performance even as influent conditions change.

IMPACT

For Hanson, stable treatment performance reduced reliance on correction chemicals and enabled continuous internal reuse, improving water efficiency and supporting sustainability goals without increasing operational demands.

THE RESULTS

Operational data demonstrated consistent treatment performance under variable industrial conditions:

- **Total Suspended Solids (TSS): 92% reduction**
- **Turbidity: 96% reduction**
- **Iron: 86% removal**
- **Metals and suspended solids: typically >95% removal**
- **pH: remained stable with no requirement for correction chemicals**

Treated effluent was reused continuously within site processes supporting circular-economy ambitions. Automated control maintained effective treatment performance despite fluctuations in load.

"This is a continuous cement and aggregates operation, so the system had to run as part of production. We configured Soneco to handle changing conditions and fit into the existing setup without disrupting throughput or adding complexity for the site team."

Mike Rattenbury, COO Power & Water

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