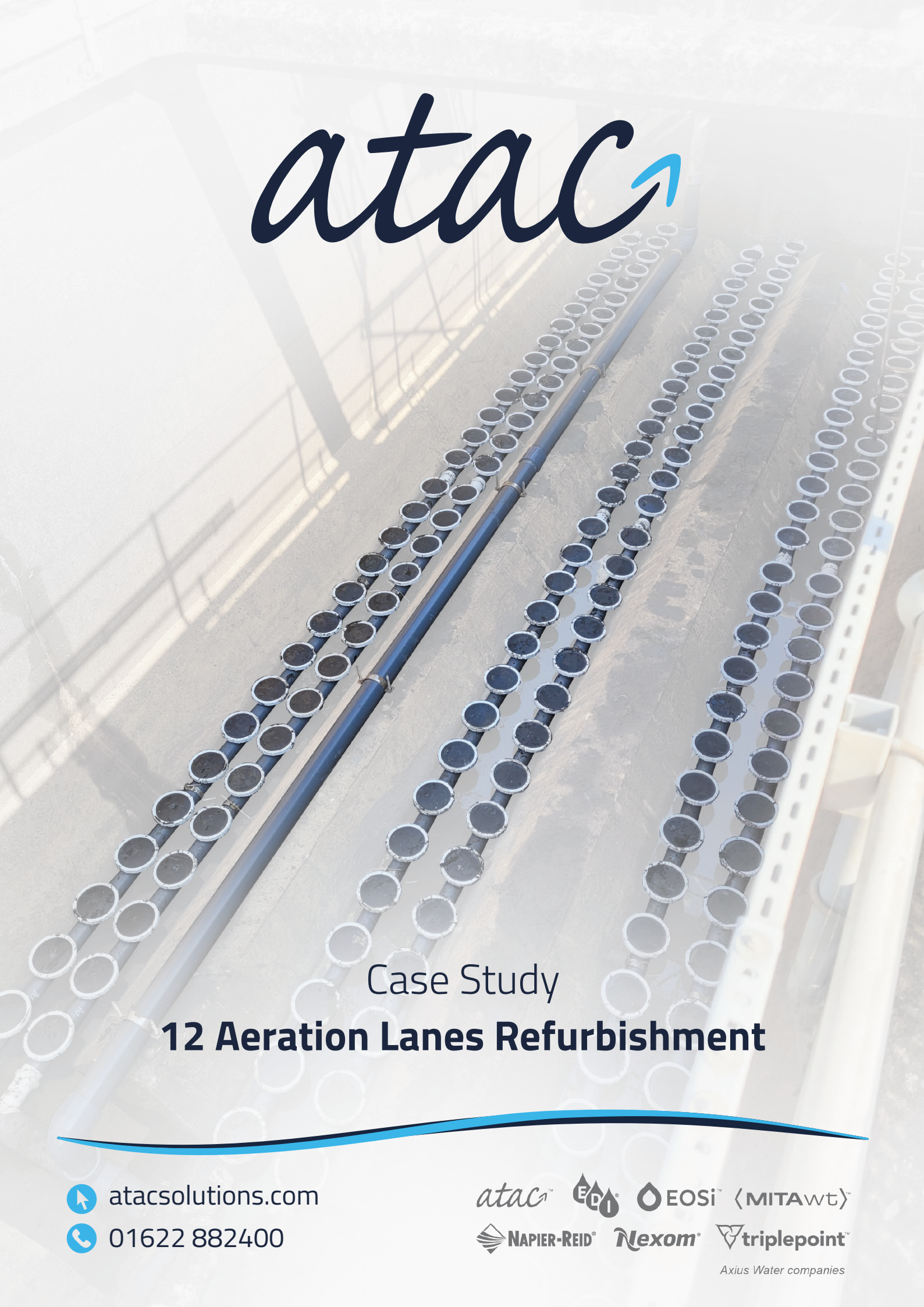

Case Study

12 Aeration Lanes Refurbishment

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Axius Water companies

12 Aeration Lanes Refurbishment

CASE STUDY

Project Duration: February 2024 – April 2025

Project Overview

The client's STW operates three separate Activated Sludge Plant (ASP) stages. After the successful refurbishment of ASP Stage 2 ATAC Solutions was contracted to carry out a comprehensive refurbishment of 12 lanes, covering mechanical, civil, electrical, and ICA scopes under CDM 2015 Regulations.ASP Stage 1, due to its age and deteriorating condition, required a full re-doming of its 12 aeration lanes.

Scope of Works

Re-Doming of 12 Aeration Lanes

- Pipework Installed: 1,896 meters
- Diffusers Replaced: 4,254 units
  - 2 Small Lanes: 216 m, 504 diffusers
  - 10 Large Lanes: 1,680 m, 3,750 diffusers

Enabling Works

- Over-pumping into the common distribution chamber
- Supply of pumps, bunded fuel cube, drip trays, road crossing ramps
- Vacuum extraction and cleaning of grit and sludge
- On-site decanting and grit drying
- Removal and disposal of redundant pipework and diffusers

Installation and Testing

- New PVC pipework and Sanitaire 9" diffusers
- Leak testing and pattern testing of each lane
- Proving and recovery periods of 2–4 weeks per lane
- Minor civil works to support mechanical installation

Safety & Compliance

- Full compliance with CDM 2015 as Principal Contractor & Principal Designer
- Site welfare setup and secured compound
- Scaffolding for safe access and egress
- Provision of GA drawings and full documentation

Environmental and Performance Outcomes

Commissioned Aeration Lane Performance (up to April 2025):

- Total Actual BOD Treated: 7,896,554 kg
- Total Actual Ammonia (NH_3) Treated: 1,554,741 kg
- April 2025 Contribution Alone:
  - BOD: 1,042,039 kg
  - NH_3: 205,166 kg

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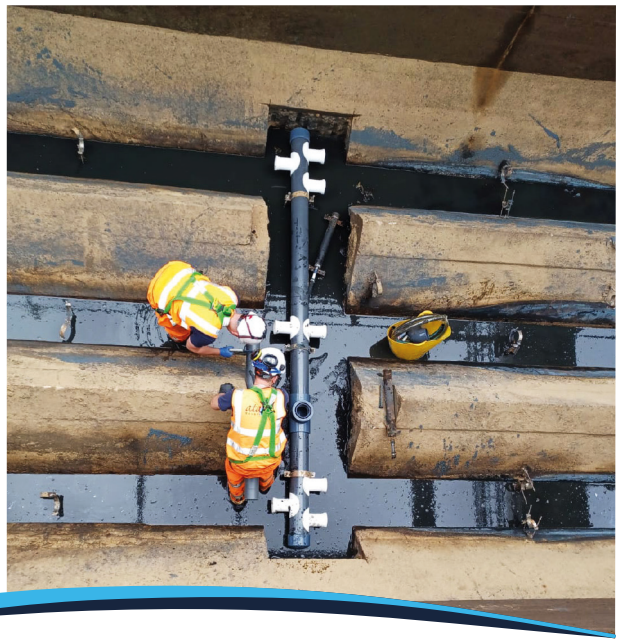
CASE STUDY

Each refurbished lane saw consistent increases in biological load processing efficiency. For example:

- Lane 13 (commissioned March 2024) processed **1.2 million kg BOD** and **235,482 kg NH_3** by March 2025, with an additional **106,787 kg BOD** and **21,025 kg NH_3** in April 2025.
- Lanes completed later in the schedule (e.g., Lane 11 commissioned mid-April 2025) demonstrated strong early performance with **54,919 kg BOD** and **10,813 kg NH_3** within just 18 days.



Project Challenges & Solutions

- **Continuous Operations:** Sequencing and proving periods allowed one lane to recover before moving on, maintaining overall plant function.
- **Sludge & Grit Management:** Innovative use of on-site decanting and drying techniques reduced haulage and disposal costs.
- **Access Constraints:** Custom scaffolding and lifting solutions ensured safe access to confined and submerged areas.

Complications Encountered

Despite the structured programme, ATAC Solutions faced several unexpected issues which required additional time and resources:

1. Lane 11 – Penstock Bracing System Failure

A failure was identified in the brace system supporting the penstock, which prevented the valve from closing properly.

A revised scope of works was initiated:

Scope

- Remove existing penstock column and handwheel
- Break out and replace the bracing plate
- Drill through the concrete slab and install new fixings
- Install scaffolding (lane remained live)
- Fix a C-channel brace from the underside using through bolts and reassemble the penstock

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CASE STUDY

Impact:
Additional structural work and working on a live lane increased complexity and safety management requirements

Lane 6 – Similar Penstock Brace Failure
A nearly identical issue was encountered in Lane 6:

Scope and resolution: Same as Lane 11, requiring careful scaffolding and structural installation while the lane remained operational.

Lane 9 – Faulty Isolation Valve
The non-operational isolation valve prevented safe shutdown of the lane. As a result:

- Pump-down attempts failed
- Scaffolding had to be removed and re-erected at Lane 8 to maintain programme
- Lane 8 work was brought forward while Lane 9 awaited valve repair

Impact: Additional scaffolding costs and potential impact on the overall project timeline.

Site Flooding
Heavy site flooding occurred during the programme, delaying planned works and site access. This required reactive scheduling and posed risks to safety and progress.

Results
Despite challenges—including structural failures, equipment issues, and environmental delays—ATAC Solutions successfully refurbished all 12 ASP 1 aeration lanes. The project enhanced the plant's operational reliability, biological treatment efficiency, and long-term resilience. Adaptability and engineering expertise allowed the team to mitigate delays and maintain quality under pressure.

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