atac

Case Study

MBBR Upgrade
North West Sussex WRC

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MBBR Upgrade

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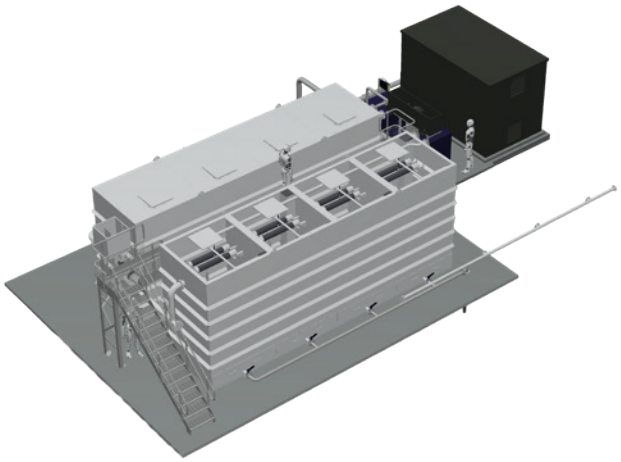
Project Overview

ATAC Solutions Ltd successfully designed and delivered a bespoke Moving Bed Biofilm Reactor (MBBR) installation at a wastewater treatment site in North West Sussex. The project was undertaken to meet more stringent ammonia and phosphorus discharge consents, while also improving operational reliability for a rural site serving a population equivalent (PE) of 600.



This upgrade builds upon ATAC's proven SAF (Submerged Aerated Filter) technology, with a tailored adaptation for MBBR applications, providing enhanced process stability and performance in challenging site conditions.

The Challenge

The existing treatment infrastructure consisted of two ATAC 44 SAF units installed approximately five years earlier. Although these units generally met performance expectations, they were periodically impacted by water snail infestations. These infestations compromised the biofilm, leading to occasional spikes in ammonia (NH_3) levels. Despite ATAC's efforts to mitigate the issue through operational adjustments, evolving environmental regulations, including a tighter ammonia consent of 4 mg/l and strict phosphorus limits, necessitated a long-term solution.

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Our Solution

Following a technical review and collaboration with the client, ATAC proposed replacing the SAF units with custom-built MBBR 44/22 systems, engineered specifically to address the site's unique challenges.

Key elements of the solution included:

- Adaptation of SAF design to support MBBR process requirements, enabling a straightforward retrofit with improved media movement and biological resilience.
- Sequential replacement of the SAF units to maintain site compliance during installation and commissioning.
- Buy-back arrangement, with the existing SAFs returned to ATAC's hire fleet, offering cost efficiency to the client.

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The MBBR design was chosen specifically to combat snail egg retention, as the continuous movement of the biofilm media prevents the static conditions preferred by snail populations. The first MBBR unit was commissioned in March 2025, with the second following in May 2025.

Results and achievements

Despite challenging influent conditions, including ammonia levels occasionally exceeding 50 mg/l due to low hydraulic loadings—the new MBBR system has consistently delivered sub-1 mg/l NH_3-N effluent concentrations.

This unit's performance:

- Exceeds the required 4 mg/l consent limit, even under peak load conditions.
- Demonstrates exceptional efficiency for a single-stage biological treatment process.
- Validates the MBBR technology as a robust, low-maintenance alternative to SAF in sensitive rural applications.

The installation has been well received by both the client and the ATAC team, reaffirming ATAC's commitment to delivering innovative, site-specific wastewater treatment solutions that adapt with regulatory demands.

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