

atac



Case Study

Vertical Submersible Aerated Filters (vSAF)

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Client Challenge

ATAC was approached by a Water PLC client with the challenge of installing additional biological treatment into an already congested wastewater treatment works. With an extremely limited footprint to work with, ATAC's process team devised an innovative solution.

Our Solution

The team transformed a proven SAF design, positioning the external tank on a vertical plane instead of a conventional horizontal plane, creating the Vertical Submersible Aerated Filter (vSAF).

Key Benefits

Smaller Footprint

One of the standout advantages of vSAF is its smaller footprint compared to conventional SAF units. This compact design allows for more flexibility in terms of installation, especially in areas where space is limited. The reduced size also contributes to lower construction costs and faster installation times.

Efficient Oxygen Transfer

Efficient oxygen transfer is crucial in wastewater treatment processes, and vSAF excels in this aspect. Thanks to its vertical design, the unit achieves a remarkable oxygen transfer rate of 5% O₂/m. This high efficiency is attributed to the depth of the system, allowing for effective aeration and oxygenation of the wastewater.



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Gravity Flow and Tertiary Treatment Integration

Another advantage of vSAF is its ability to allow gravity flow from the top of the unit into other forms of tertiary treatment, such as sand filters, if required. This integration simplifies the overall treatment process and provides more options for achieving desired effluent quality.

Reduced Blower Sizes

SAF units require blowers sized according to the surface area (m^2) of the media to ensure effective scouring, which removes any dead biomass. This reduction in blower size not only results in cost savings but also contributes to energy efficiency.

Environmental Impact

Based on average flow, each year the system is in operation we will contribute to the removal of:

↻ 11,264 kg BOD

↻ 1,453 kg NH_3



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Technical Specifications

Flows and Loads

Average flow	1.5 l/s
Peak flow	6.3 l/s
Average influent BOD	30 mg/l
Average influent NH ₃	10 mg/l
Effluent BOD	15 mg/l
Effluent NH ₃	3 mg/l

Additional Features

- ↪ Stainless steel modular biological treatment plant
- ↪ Low maintenance requirements
- ↪ Quick and easy to deploy
- ↪ Efficient oxygen transfer
- ↪ Lower blower sizes
- ↪ Minimal operational input required
- ↪ 25+ Year lifespan

Applications

vSAF can be used for both secondary treatment (BOD and ammonia removal after primary settlement tanks) and tertiary treatment (additional nitrification for existing humus tank effluents). It is built offsite which reduces construction time when compared to other on-site build options.

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