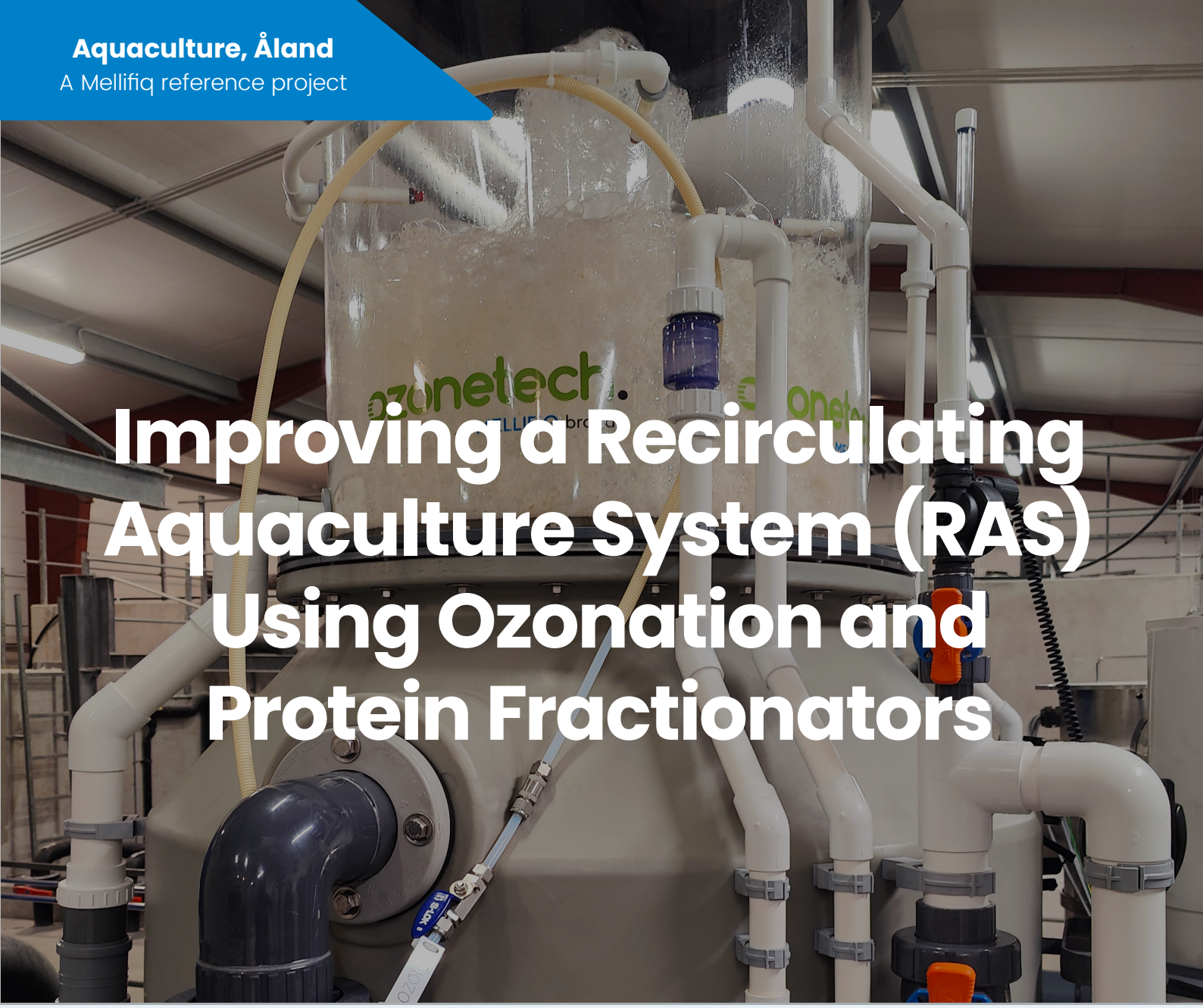
Aquaculture, Åland
A Mellifiq reference project



Improving a Recirculating Aquaculture System (RAS) Using Ozonation and Protein Fractionators

Multi-stage solution enhances fish health and ensures compliance with EU discharge standards

MELLIFIQ

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Introduction

For this project, we are traveling to the Åland Islands in Finland to work with a client who manages fisheries that play a central role in regional environmental conservation through fish stocking, habitat restoration, stock monitoring, and regulatory efforts.

Facts

Location:	Åland, Finland
Application:	Recirculating Aquaculture System (RAS) treatment
Industry:	Aquaculture

Solution

Mellifiq delivery:	Ozonetech RENA Pro ozone systems, protein fractionators, front-end engineering design, installation and commissioning.
Capacity:	More than 200 m3/h recirculating flow
Purpose:	Lower nutrient loads, improve water quality, increase oxygen levels, disinfect, reduce mortality rates, prevent use of antibiotic and avoid biocides.
Brands:	ozonetech. a MELLIFIQ brand

The problem

One of our client's facilities in the region operates a recirculating aquaculture system (RAS) to support fish populations, uphold environmental standards, and meet EU discharge directive targets.

Despite the use of traditional UV purification, the facility faced significant water quality challenges and elevated fish mortality rates.

High concentrations of dissolved organic matter (DOM) created suboptimal conditions for fish health, promoting the spread of pathogens and increasing nutrient loads—particularly phosphorus and nitrogen—in the discharged water. This not only threatened fish mortality but also jeopardized compliance with EU water discharge directives.

The spread of harmful pathogens, combined with increasingly strict regulations, led the company to seek a more reliable and efficient RAS treatment solution.

With extensive expertise in water treatment challenges, Mellifiq was well-positioned to take on the task and deliver a tailored system designed for the conservation center's needs.

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Fishery Conservation Center on Åland Island, Finland.

The solution

To address the issues, Mellifiq engineered and implemented an advanced water treatment solution combining the Ozonetech RENA Pro ozone system with high-efficiency protein fractionators. This multi-stage design was specifically tailored to the site's conditions.

In the first stage, recirculated water passes through the protein fractionator, also known as a skimmer, where ozone injection generates microbubbles that coagulate and physically separate dissolved organic matter.

This process significantly reduces nutrient loads, enhances oxygen levels, disinfects the water, stabilizes water quality, and lowers mortality rates.

Working in synergy with the fractionator, the RENA Pro system injects concentrated ozone to oxidize and eliminate bacteria, viruses, parasites, and fungi. Ozone also enhances floc formation and foam separation, further increasing the system's purification capacity. The result is a fully chemical-free, highly efficient disinfection process that eliminates the need for antibiotics or biocides.

The installation includes an ozone generator and cooling system, along with an ozone meter, sensors, and the O3Eye™ control system to monitor and report the status of the ozone generators.

Solution fact:

- Lower nutrient loads
- Improve water quality
- Increases oxygen levels
- Disinfect
- Reduce mortality rates
- Prevent use of antibiotics
- No need for biocides

Fractionators are essential tools in applications where effluent water contains large organic particles, commonly in aquaculture, zoos, and aquariums.

Ozone injection generates microbubbles that coagulate and physically separate dissolved organic matter.

Evaluation

The installed solution has significantly reduced fish mortality rates and eliminated the facility's reliance on UV disinfection. Water remains crystal-clear, and the system operates with minimal maintenance—delivering a highly efficient, fully chemical-free disinfection process that requires no antibiotics or biocides. Additionally, the facility now achieves full compliance with EU discharge targets for phosphorus and nitrogen, ensuring stable, long-term operation.

Mellifiq served as a full-scope provider—managing everything from system design to commissioning—reinforcing its role as a leader in sustainable aquaculture innovation.

Visual comparison of fish tank water quality pre- and post-treatment.

Fish mortality rates have significantly decreased and the conservation center now experiences a completely chemical-free treatment process.

About Mellifiq

Mellifiq is a multi-awarded environmental service company group, that has since the early nineties evolved into a world leading system and solution provider with multiple groundbreaking applications for industrial, municipal, and real estate clients. We supply cutting-edge technologies to manage the most sophisticated air, water, and energy challenges.

Mellifiq offers a complete range of air and water treatment technologies and solutions across multiple industries such as processing industry, energy sector, food and beverage, pharmaceutical, wastewater treatment and commercial real estate.

Mellifiq offers strong and renowned brands, such as Ozonetech, Nodora, Water Maid, Saniray, Axolot and world-class engineering services combined an excellent track record of more than 40 years of innovation. We help our clients achieve the most efficient and sustainable solutions while creating the maximum value for their businesses.

With several business units across Europe, Mellifiq is headquartered in Stockholm where research and development, production, QA and certification all take place. Our unique technology and our extensive expertise have made us the Center of Excellence for the world's most complex projects, and a global player with installations on all six continents.

Everyday millions of people rely on our solutions for ventilation, disinfection, sanitation, and odor control. We are committed to raising the bar for the concept of clean and the industry standard for engineering, technical services and general contracting.

For additional information, visit our website at www.mellifiq.com

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