Kraft pulp mill, Sweden
A Mellifiq reference project

Delivers Breakthrough Effluent Solution for Kraft Pulp Mill

The AxoPlus® system delivers a sustainable solution for pulp mill effluent, protecting potable water sources

MELLIFIQ

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In this project, we are partnering with a global leader in fiber-based materials—a Kraft pulp mill with a vision to become the preferred provider of sustainable specialty materials. The company operates through three divisions designed to address global trends: Filtration & Life Sciences, Food & Consumer Packaging, and Protective Materials.

The company adds value by combining fibers with advanced technology, driven by an innovative and entrepreneurial culture, and continuously exploring new materials and applications.

Facts

Location :	Sweden
Applications:	Removal of suspended solids, phosphorus and emulsified oil
Industry:	Pulp and paper

Solution:

Mellifiq delivery:	The AxoPlus® system, designed for a capacity of 60 m³/h, including a flotation unit and AxoPur reactor with a hydraulic capacity of 80 m³/h
Capacity:	60 m³/h
Energy consumption:	0.2–0.4 kWh/m³
Performance:	Removal of Suspended solids 75-85%, Phosphorus 75-85%, Total Organic Carbon (TOC) 35-40%

The problem

Our client runs a kraft pulp mill with a production capacity of nearly 200,000 tons per year of both unbleached and bleached products. A specialty of the mill is ultra-pure pulp, specifically designed for electrotechnical applications.

The pulp mill is the last remaining facility in Sweden without proper effluent treatment, presenting a significant environmental challenge. This issue is heightened by the presence of a pristine lake, which serves as a crucial water source for potable water production. Historically, the mill's substantial discharges of organic materials and nutrients into the lake have caused severe eutrophication and the formation of dead zones.

Eliminating these discharges is essential for creating lasting positive change, and environmental authorities have long called for decisive action.

Over the years, the mill has faced increasingly stringent environmental standards, driven by rising public awareness and the EU Water Framework Directive.

After exploring the market and engaging with multiple potential suppliers, the company initially implemented a biochemical treatment process to address wastewater challenges. However, this approach failed to deliver the desired results.

Washwater from the bleaching constitutes a large part of the effluent.

Effluent from the kraft pulp mill flows into the lake, causing eutrophication and dead zones.

The solution

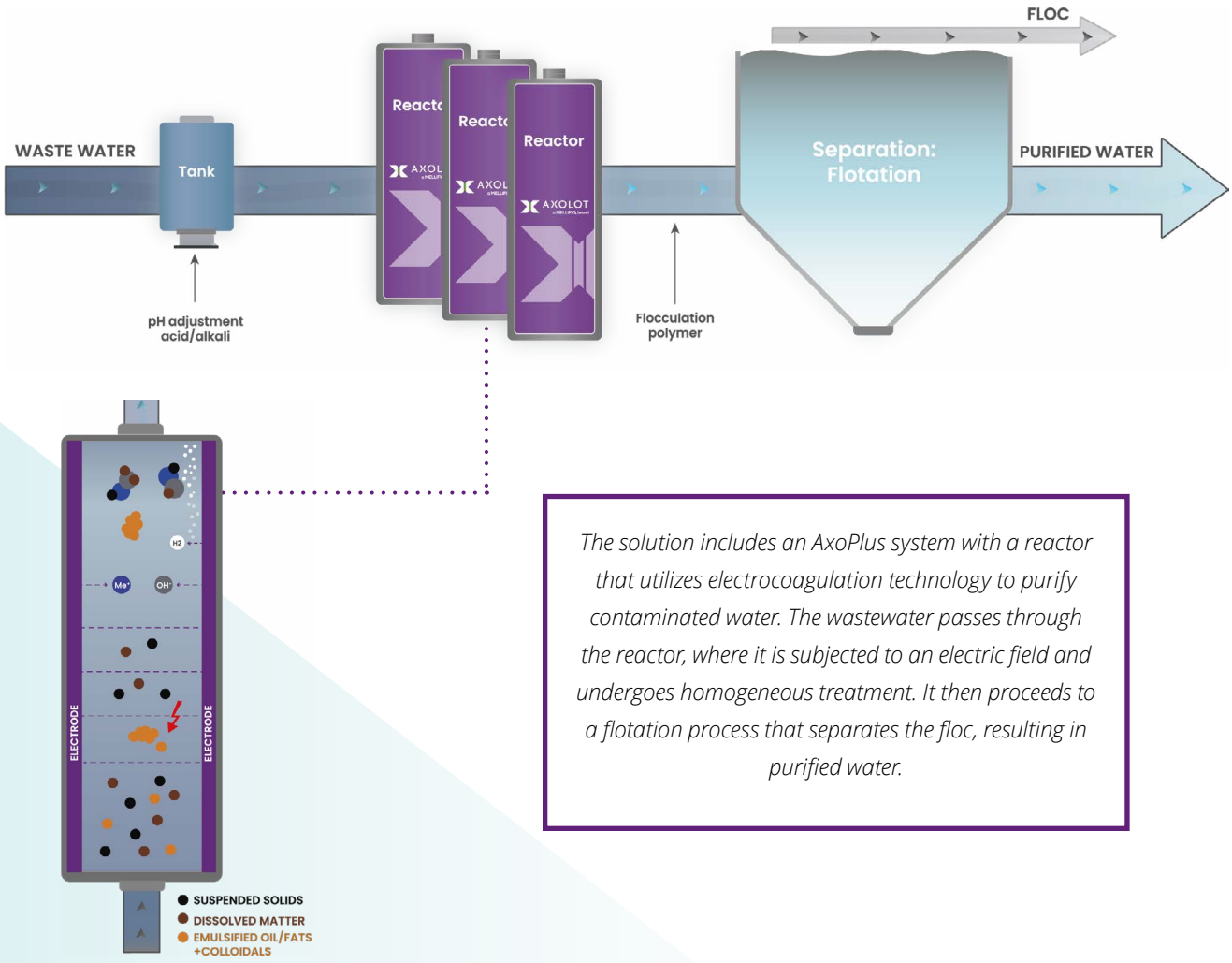
Managing the mill's requirements involved handling not only the process water flow from the bleach plant but also the flow from the drying machine, making the treatment system essential for maintaining operational efficiency and meeting environmental standards.

The AxoPlus system clearly had the essential features to meet the mill's environmental goals. The solution included an AxoPlus system with a capacity of 60 m³/h, featuring an AxoPur reactor with a hydraulic capacity of 80 m³/h and a flotation unit. To address the mill's treatment needs, which required a capacity of 640 m³/h, we conducted a three-month on-site trial to assess the system's performance.

During this period, the systems were operated to evaluate, optimize, and demonstrate the functionality and reliability of the technology under the mill's prevailing conditions.

The results were highly positive, both in terms of efficiency and cost-effectiveness. The reactor's dimensions matched those planned for the full-scale system, which is designed to operate using multiple reactors functioning in parallel.

The test system was installed at the mill and integrated into regular operations.



The solution includes an AxoPlus system with a reactor that utilizes electrocoagulation technology to purify contaminated water. The wastewater passes through the reactor, where it is subjected to an electric field and undergoes homogeneous treatment. It then proceeds to a flotation process that separates the floc, resulting in purified water.

Evaluation

Our client successfully addressed the environmental challenges at its kraft pulp mill by implementing the AxoPlus system for effluent treatment. The results were highly positive, demonstrating exceptional efficiency in reducing suspended solids and phosphorus with 75-85%.

Furthermore, the combination of AxoPlus, followed by the existing MBBR unit at the mill as post-treatment, achieved a highly efficient reduction of TOC/COD—up to 70%.

AxoPlus largely removes ecotoxic extractives, which can otherwise reduce the efficiency of the MBBR. As a result, the MBBR operates more efficiently when positioned as a post-treatment to AxoPlus, effectively breaking down the shorter carbon chains.

The system demonstrated low energy consumption, ranging from 0.2 to 0.4 kWh/m³, outperforming alternative treatment methods. This partnership effectively demonstrated the reliability and efficiency of electrocoagulation technology, solving complex wastewater treatment challenges for the pulp and paper industry.

Efficient wastewater treatment at kraft pulp mill.

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 and Water Maid, 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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