

**Klippan wastewater
treatment plant**

A Mellifiq reference project

Micropollutant Removal at Klippan Wastewater Treatment Plant



**Unique solution using advanced
oxidation, adsorption and
nano-filtration achieves 100%
treatment levels at Klippan
municipality wastewater facility**

MELLIFIQ

Wastewater Treatment Plant, Klippan, Sweden

Located at the South-West tip of Sweden, Klippan municipality boasts a top performing wastewater reclamation facility, necessary for sustaining the sensitive ecosystem in nearby recipients. The facility serves the entire city of more than 10,000 individuals, with BOD, Total-N and phosphorus removal.

Facts

Name:	Klippan wastewater treatment plant
Location:	Klippan, Sweden
Industry:	Public utility
Challenge:	Implement a solution with near complete API removal from plant effluent using multiple technologies
Project value (EUR):	500,000

Solution:

Mellifiq delivery:	Contracting including Ozonotech RENA Tellus X80, Water Maid FlexKarb C and S, Water Maid N-series in a containerized configuration
Performance:	99% API removal at less than EUR 0.02/m ³ treated water
Capacity:	Up to 120 m ³ /hr for full scale implementation
Dimensions HxWxD (m):	3x6x2

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The problem

Despite excellent treatment performance and exceeding the current treatment compliances, Klippan wastewater treatment plant grapples with emitting micropollutants, including active pharmaceutical ingredients (API). Since preserving the pristine recipients is a priority for the city council, a solution needed was needed due to the long-term detrimental effects of APIs on flora and fauna.



Image from Klippan wastewater treatment plant.

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The Solution

Mellifiq was approached to design a complete solution for Klippan municipality. The requirements were straightforward: deliver a future-proof solution with highest possible removal rates of APIs, exceeding the expected future legislation levels, at lowest possible operating costs. Various technologies needed to be evaluated in order to tailor a solution to adapt to the conditions at the facility.

Mellifiq delivered a solution with performance validation, including conducting a pre-study to determine the API concentration profile throughout the current treatment process, showing effluent API concentrations in excess of 100,000 ng/L, equivalent to more than 40 kg annually.

Mellifiq implemented advanced oxidation through a turn-key RENA Tellus X ozonation system, coupled with a Water Maid FlexKarb C adsorption polishing step (O-GAC™) as well as Water Maid N-series nanofiltration system. All systems were integrated in mobile containerized units as a complete tertiary treatment process line, including full contracting responsibilities for solving feed water from the existing biological treatment process.

A pre-filtration step to ensure maximum uptime and performance was implemented using our Water Maid FlexKarb S systems.



Interior design of the O-GAC™ process.

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Evaluation

Mellifiq conducted a complete performance evaluation including API treatment levels with efficiency reports, showing less than EUR 0.02/m³ in total operating costs for the combined oxidation and adsorption O-GAC™ process, achieving more than 99% total API removal rate. The Water Maid N-system achieved more than 95% removal at less than EUR 0.09/m³ operational costs. It was established that key API markers including Diclofenac and Paracetamol were completely eliminated.

"We have removed 95 percent of all pharmaceutical residues. Our goal was 80 percent."

Mikael Gulin, Section Director



Exterior of the containerized systems with ozonation, adsorption and nanofiltration.



Water Maid N-series in operation.

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 Ozonotech, 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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