Glina Wastewater Treatment Plant, Romania
Bioflex – increased biological capacity | Case Study

**Client**
APA NOVA BUCARESTI, Glina WWTP, Bucharest, Romania

**Plant capacity:** 1,700,000 PE

**Process:**
- Two lines Activated Sludge (AS) for N-DN
- Active Return Sludge (ARS)
- One anaerobic side stream for bio-P

**Implemented:** 2013

**The client’s needs**

The City of Bucharest enjoys a booming economy within the EU framework, as many other cities in Romania, and in order to comply with EU’s environmental standards, the city has to improve its public services within water, wastewater and other environmental facilities to provide for its large population.

The capacity of Glina Wastewater Treatment Plant (WWTP) is not sufficient to address serious load events and rain events. The biological stage of the plant is overloaded by 30 percent in respect to nitrogen. The inability to manage the continuous overloading of the plant has made it impossible to comply with the above standards. The amounts of wastewater bypassed before the biological step to the River Damborita as well as the unsatisfactory nitrogen removal capacity were two important challenges to be addressed.

The City of Bucharest aim was to increase the Glina WWTP’s nitrogen removal capacity to handle the design flow through the biological stage and fulfil the effluent demand of 10 mg/l Total-N.

**Our solution**

In co-operation with Veolia Water Romania, Krüger A/S, a Veolia Water Technologies company, installed the STAR Utility Solutions™, a suite of intelligent software tools for online control of wastewater systems without extra civil works costs – and the improvement came from accurate process control and not from extension of the process volume.

The flexibility of the STAR Utility Solutions™ makes it possible to find the most suitable solution for each plant. For Glina WWTP, the **Bioflex solution** implemented included a complementary set of strategies that optimised the process conditions. The solution comprised control of aeration, chemical precipitation and return activated sludge, as well as optimisation of the load going through the biological treatment step.

**WWM-Control** includes multiple advanced levels of fallback strategies, outstanding quality check of online sensors, excellent user interface, advanced reporting systems as well as the option for installation of further future controls. These features enable the plant to comply with the requirements and ensure a reliable and optimum operation.
Software

STAR Utility Solutions™
A suite of intelligent software solutions for water and wastewater facilities. Based on advanced real time control and forecasting, these intelligent tools continuously provide optimal operation and maximise the value of the existing systems.

WasteWater Manager – Control
is the advanced software control for wastewater treatment plants and networks. Comprises four different approaches:

- **Bioflex** increases biological capacity and minimises capital investments.
- **Hydroflex** increases hydraulic capacity and minimises capital investments.
- **Opflex** improves operation and reduces operating cost.
- **Sewerflex** improves control of network and minimises Combined Sewer Overflows (CSOs) and capital investment in the network.

Krüger STAR Utility Solutions™ uses an intelligent “slave”-based control strategy which allows for significant reduction in the number of required online meters, where implementation of meters in one tank (i.e. “master”) allows for control of the rest without further investment.

With the installation of STAR Utility Solutions™ a ten percent increase in performance was guaranteed with the even more ambitious expectation of 20 percent. The results from the first eight months comply with the guarantee within a safe margin.

Benefits for the client

- Increased N removal in the biological stage without any plant modifications or capital investment
- Guaranteed minimum ten percent improvement on load capacity
- Compliance with discharge effluent standards (less than 10 mg total N out of biological system)

Achievements

- Total-nitrogen out of the biological step decreased by ten percent from 10 to 8.7 mg/l
- Stability of the effluent concentration improved considerably with significantly less variation in effluent concentrations
- Flow through the biological step increased from 4.8 to 5.2 m³/s which is above the design max of 5.0 m³/s