

Eliminating ammonium load peaks from process water?

Optimised aeration control with W.T.O.S.

The initial situation

Workers at the Kornwestheim treatment plant have been seeking to optimise energy consumption and reduce the nitrogen load in the outlet for many years. However, when using an aeration control system that is exclusively based on oxygen concentration values, these efforts have their limitations. When process water is added, the high ammonium peaks lead to an increase in the nitrogen load in the outlet.

- ▶ Process water leads to high ammonium peaks
- ▶ High nitrogen load in the treatment plant outlet
- ▶ N_{tot} mean value approx. 12 mg/L

The plant

- ▶ Capacity: approx. 41,000 PE
- ▶ Built 1986–1988. Cleaned many times since then
- ▶ Chemical P precipitation
- ▶ Intermittently aerated biological treatment step
- ▶ Aerobic sludge stabilisation



The solution

Ion-selective (ISE) probes were installed in the two aeration tanks to determine the ammonium and nitrate levels. On the basis of these measurement values, the connected W.T.O.S. N/DN module (real-time controller) controls the aeration times depending on the load. Particularly when process water with high ammonium peaks is added, adapted aeration phases enable a rapid reduction in the nitrogen load.

Since W.T.O.S. was commissioned, the nitrogen load in the outlet has demonstrated a permanent reduction from approx. 12 mg/L to approx. 8 mg/L N_{tot} .

- ▶ Continuous ammonium and nitrate measurement
- ▶ Load-dependent aeration control

The advantages

- ▶ Load-dependent aeration control
- ▶ Rapid reaction to ammonium peaks
- ▶ **Reduction of 4 mg/L in the N_{tot} load in the outlet**

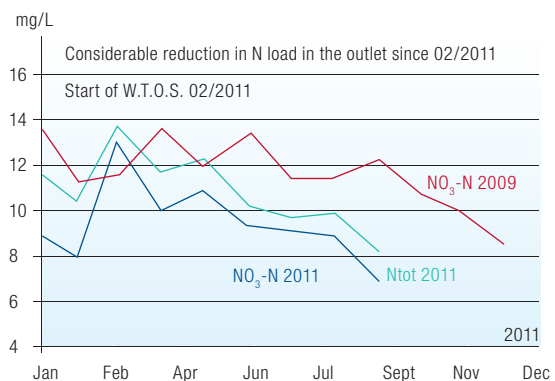


Figure 1: Effect of W.T.O.S.-controlled aeration on the nitrogen load



More information on this project can be found at www.hach-lange.co.uk

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