ANOXKALDNES

Spendrups Brewery, Sweden

The Client

Spendrups Bryggeri AB is one of Sweden's largest producers of beverages. The brewery in Grängesberg produces 500 million liters of beer every year. The production generates wastewater that contains large amounts of COD.

The Client's Needs

The goal was to design a pre-treatment plant for the brewery's wastewater, reducing organic matter before it is sent to the municipal WWTP.

An anaerobic process could be used to degrade the large amounts of organic compounds in the water. However, anaerobic digestion gives rise to odour issues and results in partially degraded compounds. An aerated process would then be required to reduce some of the remaining organic matter after the anaerobic treatment, to reduce odour resulting from production of hydrogen sulphide in the anaerobic process and to remove remaining methane.

In addition, the aerated process should be able to handle the easily degradable matter in case the anaerobic reactor is taken out of operation. The two biological steps together should reach a COD-reduction of 85 % as a monthly average to reduce the organic load on the receiving municipal treatment plant.

The Solution

The solution was an anaerobic treatment step followed by an aerated AnoxKaldnes™ MBBR process together designed to reach a COD-reduction of 85 % as a monthly average.

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Process

After passing a screen, an equalization tank and a heat exchanger warming up the water, the wastewater is treated in an anaerobic digester followed by an aerated AnoxKaldnes™ MBBR process. Easily degradable matter is removed in the anaerobic process while the MBBR reduces hydrogen sulphides and remaining methane from the anaerobic process. The MBBR also reduces some of the organic matter which is left in the water.

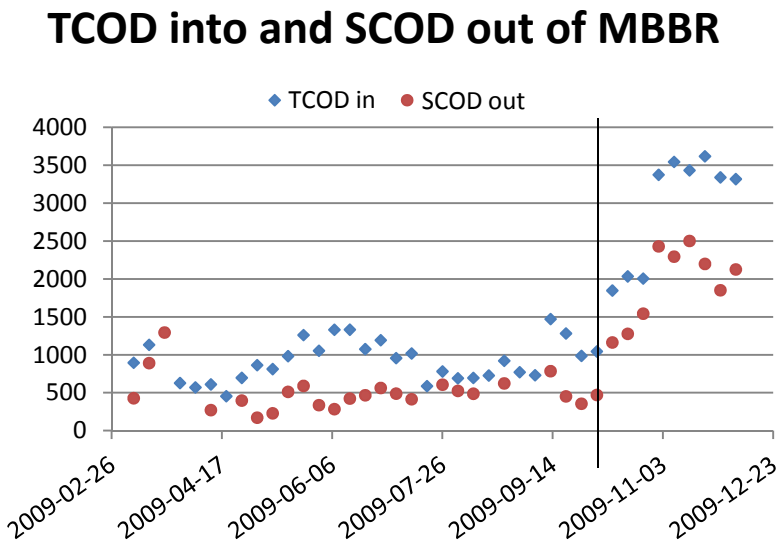
The AnoxKaldnes™ MBBR reactor is a circular concrete tank of 500 m^3 (ø 10.3 m, water depth 6 m) with a filling degree of 35 % of carriers type F1. When the anaerobic treatment is in operation with average COD load, the MBBR is designed to reduce an amount of 975 kg/d of the total COD coming from the anaerobic reactor. In case the anaerobic treatment needs to be bypassed, the MBBR-reactor should be able to reduce 2500 kg/d at maximum COD load.

Results

The figure below shows the performance of the MBBR. The anaerobic process was in operation until October 8th when it was taken out of operation, which is marked with a vertical line in the diagram.

The incoming loads to the MBBR are lower than the design loads, which results in the amount of COD reduced being lower than the capacity at design loads. In percentage, the MBBR reduces about 50% after the anaerobic treatment and about 30% if the anaerobic treatment is bypassed. These figures correspond to the design figures actual load.

Spendrups Brewery is very pleased with the performance of the MBBR.



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For further information:
AnoxKaldnes AB
www.anoxkaldnes.com
sales@anoxkaldnes.com
Tel: +46 (0)46 182150