

# VALPERCA

## MBBR Retrofit | Case Study

### Valperca SA

- Raron, Switzerland

Valperca is a Swiss fish farm situated in the Valais valley. The farm produces European perch in RAS, which is considered a delicacy in Switzerland. The Valperca plant was built in 2009 with a nominal capacity to farm 300 tons of perch per year.



### Key figures:

- **Contract:** Retrofit of existing RAS during on-going farm operation
- **Process:** Retrofit MBBR and add CO<sub>2</sub> Degasser while keeping RAS footprint
- **Capacity:** 3 RAS, each 1200 m<sup>3</sup>/h and 500 kg feed/day
- **Start-up:** Q2 2014

### The Challenge

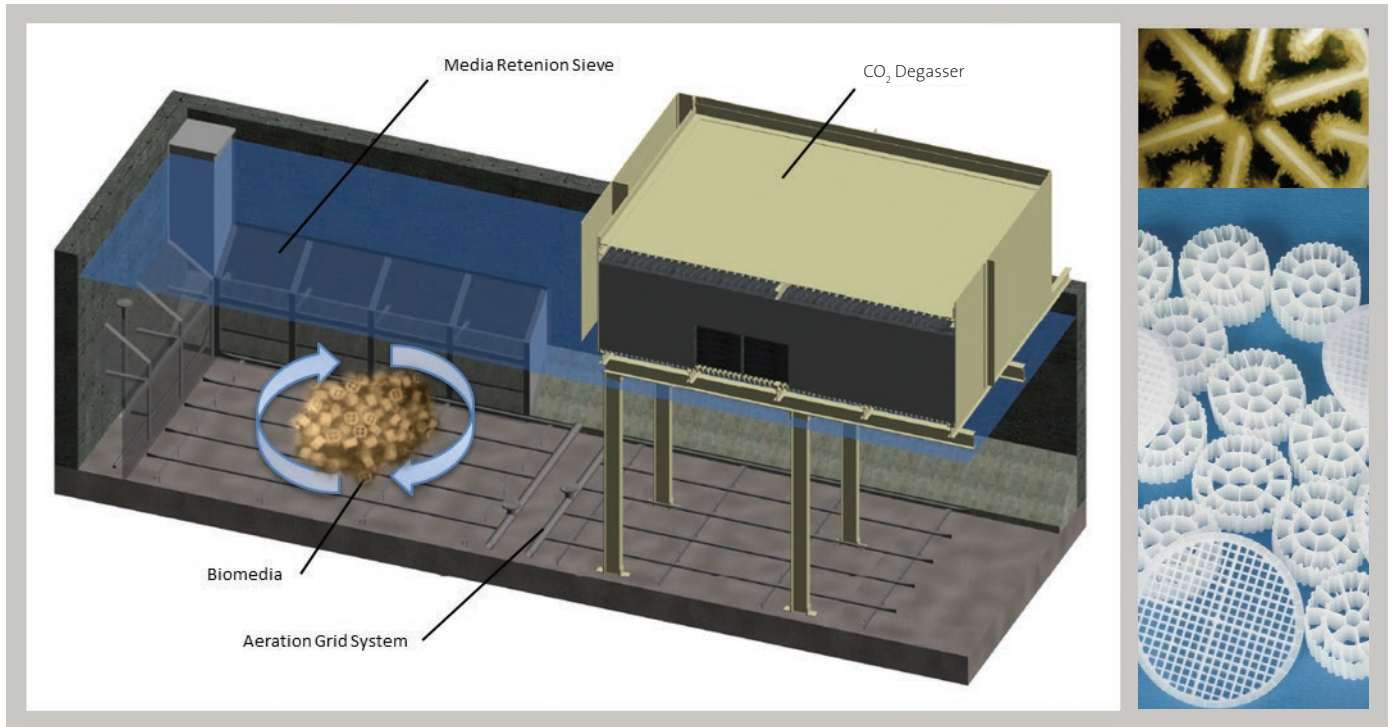
Krüger Kaldnes was contacted by the client to solve production limiting water quality issues in the three RAS systems of their fish farm. The newly build farm was not able to produce the nominal biomass of 300 MT per year for which the farm has been designed and build for. The feeding in the circuits was limited to about 50 % of the nominal capacity. Poor water quality was limiting the fish production. With an ambition to increase the performance of the existing RAS the client added intensive ozone treatment to their system. This however led to problems with the fish quality. To increase the production of the Valperca farm, Krüger Kaldnes suggested retrofitting the 3 RAS systems for taking the necessary steps to reach the nominal biomass production capacity:



- Better RAS performance
- Better water quality

### Solution

The three identical RAS units required better biological filtration and CO<sub>2</sub> stripping to improve the water quality. Krüger Kaldnes designed and delivered customized Kaldnes® MBBR equipment, a CO<sub>2</sub> degasser and new circulation pumps to be incorporated into the existing systems. This retrofit was executed during full farm operation without changing the RAS footprint.



**Figure:** Retrofitted MBBR with customized CO<sub>2</sub> degasser installed on top of MBBR reactor. **Function:** Water is supplied by circulation pump onto degasser distribution tray. From there the water trickles through the bioblocks while air is fanned in counter current from the bottom through the media allowing an efficient gas exchange. From the degasser the water drops into the MBBR reactor.

## Process Description

More efficient nitrification was achieved by rebuilding the existing biofilter into a Kaldnes® MBBR Process. The change to the high-end bio-carrier BiofilmChip™-P with a specific area of 900 m<sup>2</sup>/m<sup>3</sup>, together with an improved aeration and mixing was the key to meet the required water quality parameters in the supply water to the fish tanks.

A tailor made CO<sub>2</sub> degasser was integrated into the treatment loop, comprising a trickling filter, based on counter-current principle for efficient gas exchange. A new circulation pump was installed to deliver the water on top of the degasser.

## Results:

- ▶ Project commissioned successfully with no reserves/no rejects
- ▶ Stable water quality according to process guarantee and to client satisfaction
- ▶ 80% reduction of ozone consumption in the RAS
- ▶ Better fish quality, faster growth, shortened production time
- ▶ 90% of maximum feed capacity reached within first weeks after start-up

## Krüger Kaldnes

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