Yucaipa, CA

AnoxKaldnes Hybas™

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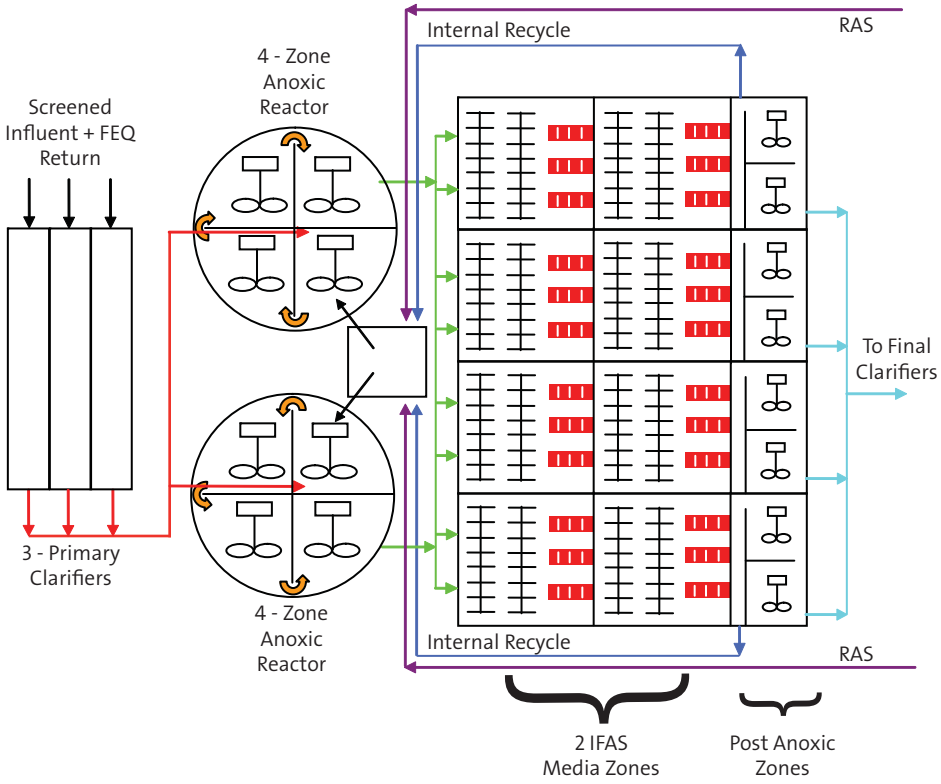
Overview of Wochholz Water Recycling Facility

The Challenge - Upgrade

In 2007 the Yucaipa Valley Water District in Yucaipa, CA upgraded their Activated Sludge treatment plant to a Kruger AnoxKaldnes Biofilm + Activated Sludge (HYBAS™) process. The plant expansion was driven by an increase in hydraulic loading and a new Total Inorganic Nitrogen Limit that was lowered from 10 mg/L to 6 mg/L.

Revised Biological Process



Process Solution

The process flow scheme includes flow equalization of peak flows, ¼" fine screening, primary sedimentation, Kruger AnoxKaldnes Hybas™ biological treatment and secondary sedimentation for treating the influent wastewater to a 12-month average of <6 mg/L Total Inorganic Nitrogen. Membranes and UV disinfection are used after final clarification to meet reuse quality water.

The biological treatment process consists of pre-denitrification, BOD reduction, nitrification and post denitrification in order to meet the new 6 mg/L Total Inorganic Nitrogen limit. The existing trickling filters were converted into pre-anoxic zones for denitrification of recycled nitrates.

The first two aerobic reactors are complete mix aerobic reactors and have been retrofitted with a new AnoxKaldnes aeration system, AnoxKaldnes K3 biofilmc carrier, and wedge wire screens. Reactor 1 has a 65% volumetric fill fraction of the K3 media, while reactor 2 has a 41% volumetric fill. After the AnoxKaldnes Hybas™ reactors nitrify the wastewater, a portion of the MLSS is collected and recycled back to the circular anoxic reactors for denitrification.

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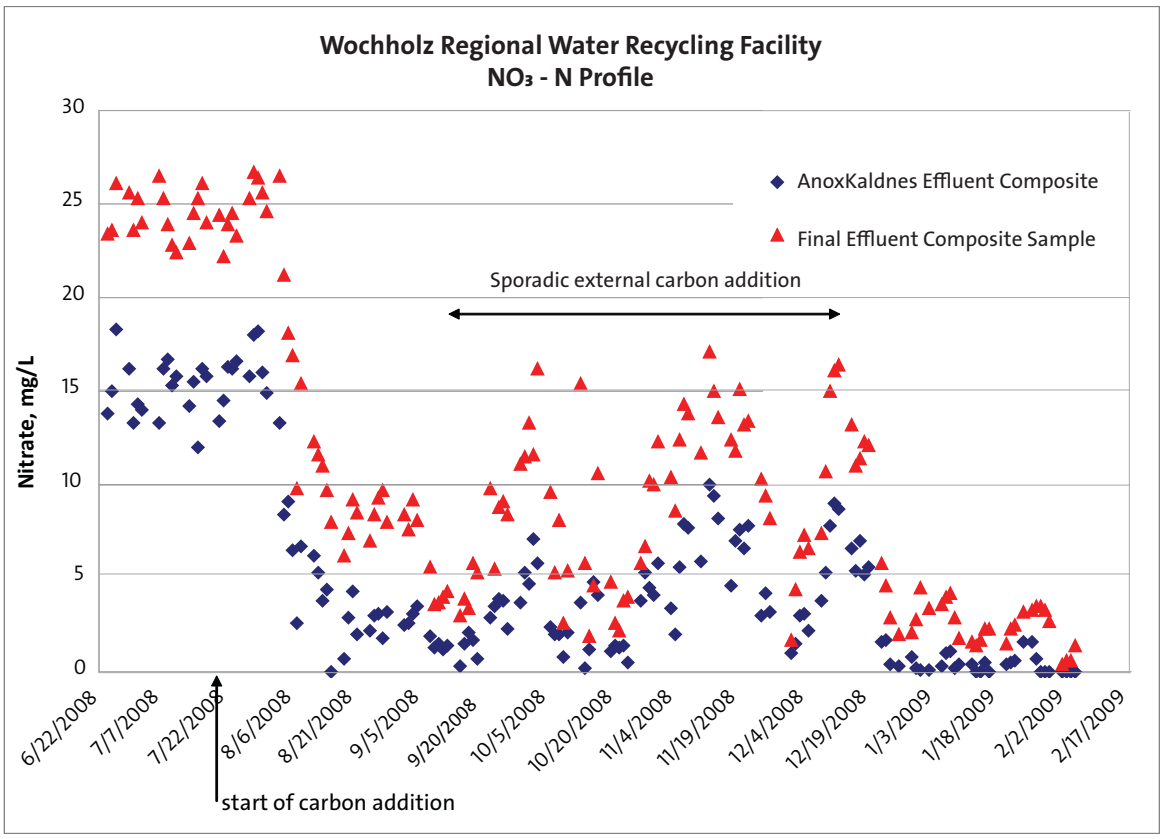

AnoxKaldnes Nitrate Removal Rate

The flow that is not recycled is sent to post-denitrification reactors for final polishing of the nitrates in the wastewater. Methanol is added for the carbon source into this zone. Effluent from this zone flows to the circular clarifiers where the settled MLSS becomes RAS and is pumped to the splitter box ahead of the anoxic zones. The clarified effluent undergoes tertiary filtration and is then disinfected with UV before it is discharged from the plant.

The Kruger AnoxKaldnes Hybas™ process utilizes activated sludge biomass and fixed film in the same reactor. Using this technology has many benefits when upgrading existing activated sludge plants. For instance, the plant has the possibility to upgrade hydraulically as well as meet new ammonia and/or TIN effluent limits in a cost-effective, owner friendly manner. The utilization of the Kruger AnoxKaldnes™ fixed film media also helps reduce the TSS loading on the clarifiers.

Conclusion

By retrofitting the plant's existing basins with the Kruger AnoxKaldnes Hybas™ technology, the District was able to increase the capacity of the plant from 4.5 MGD to 8 MGD (30,200 m³/day). The plant has been able to demonstrate TIN levels of less than 5 mg/L once sufficient carbon was present in both pre and post denitrification reactors.

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