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Topic: Enhanced benchmark system for wastewater treatment plants

At present, the benchmark developers recognize that while phosphorus (P) removal has been a focus of WWTP design and operation, its inclusion in plant-wide models is lagging behind that of C and N removal. Moreover, there is a gaining interest in P recovery, especially in the European Union, where raw phosphorus is hardly available while huge amounts of phosphorus are wasted and end up in surface waters causing eutrophication. Aside from P, sulfur (S) in wastewater is also gaining importance due to the operational problems caused by hydrogen sulfide (e.g. odour problems, corrosion, toxicity), especially when dealing with wastewater streams coming from tanneries and distilleries.



As a consequence, the current benchmark needs to be updated to include processes to describe biological and chemical P removal as well as S reduction processes, novel plant-wide control strategies and extended evaluation tools. As there is a large interest in resource recovery, which is mostly accomplished by precipitation within the WWTP, an improved physico-chemical model is also needed. Thus, inclusion of a plant-wide pH model, extending the anaerobic digestion model to describe phosphorus, sulfur and other relevant variables is of primary importance. The resulting model can be used for simulation-based scenario analysis aiming at finding ways to improve the operation of a WWTP designed for C, N, P, and S removal.