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Case Study

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Sludge reduction by a micro-aerobic hydrolysis process: a full-scale application and sludge reduction mechanisms

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Abstract: The process **performance** of a full-scale sludge process reduction activated sludge (SPRAS) system in long-term operation were investigated by inserting a micro-aerobic tank and a clarifier before conventional activated sludge process. The full-scale SPRAS for industrial park wastewater treatment achieved efficient pollutants removal and a low observed sludge yield of 0.074 g SS/g COD. Batch tests showed that influent feeding into the micro-aerobic tank favored sludge reduction, and obtained a sludge decay constant of 0.168 d⁻¹. The SPRAS enriched slow growers and hydrolytic bacteria for sludge reduction, showed high simultaneous nitrification and denitrification efficiency in the micro-aerobic tank with abundant denitrifying bacteria, and improved sludge settlability by enriching floc-forming bacteria. Process configuration of the SPRAS was beneficial to enhance maintenance metabolism, cyclic micro-aerobic and anaerobic uncoupling, and lysis-cryptic growth for sludge reduction. Techno-economic

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