25 June 2021 (Friday)

7.00pm-8.30pm (SGT) (GMT +8)
Session 3.8 – Biofilm Processes

Session Chair(s): Glen Daigger, University of Michigan (USA)

Maximizing Asset Capacity And Performance Via Process Intensification Using MABR Technology

W. Bagg, E. Joubert, A. McNeil, J. Peeters. Water Corporation (Australia)

Following extensive investigation Water Corporation has identified Membrane Aerated Biofilm Reactor (MABR) as the preferred technology to increase secondary treatment capacity at two large Perth Metro facilities. The innovative technology has the potential when retrofitted into existing process volume to intensify secondary treatment capability and reduce process aeration demand and greenhouse gas emissions. Starting in mid-2020, a two-year pilot trial at the new Subiaco Water Research & Innovation Precinct (WR&IP) will test MABR suitability and confirm location-specific system design requirements. The trial is the first of its kind in Australia and will be supported by local and international experts.

Testing MABR technology at Ejby Mølle

N. Uri Carreno, T. Constantine, P. Nielsen, J. Sandino, A. Willoughby. VCS Denmark (Denmark)

Utilities around the world are increasingly being challenged to "do more with less", and this is particularly true with respect to both energy efficiency and process intensification, while still achieving or improving upon effluent targets. Membrane aerated biofilm reactor (MABR) technology has emerged as a highly attractive technology that promises to achieve both of these goals. Since June 2018, VCS Denmark has been testing four full-scale MABR units in a hybrid (IFAS type) configuration. The demonstration is equipped with several online instruments that allow for continuous data acquisition of nitrification rates and oxygen transfer rates, among others. Visual inspection of the units every three months and periodic intense testing such as batch tests or argon transfer tests are also major components of the study. During the first year of operation, MABR has demonstrated to be capable of complete simultaneous nitrification-denitrification. Despite challenging conditions during the start-up, the oxygen transfer efficiency and the nitrification rates continue to improve.

Quick And Compact Package Type DHS Pilot Plant In Khon Kaen City, Thailand

Y. Kirishima. NJS Consultants Co., Ltd. (Japan)

Khon Kaen, which is a major and a rapidly growing city in North-East Thailand, has an existing sewage treatment system using aerated lagoons with a large footprint (area). However, the efficiency and the capacity are shortening due to the population increase and other causes.
Downflow Hanging Sponge (DHS) reactor is an economical and an ecological wastewater treatment technology originated in Japan. This project aims to achieve the discharge standard in Thailand using DHS reactor with short hydraulic retention time (HRT), and to demonstrate its compactness, odorless, efficiency and quick installation.
The pilot plant, which is a combination of a primary sedimentation (hereinafter PS) tank and DHS reactor with the capacity of 160 m3 per day when operating HRT 30 minutes for sponge media volume, achieved the compactness, odorless and stable effluent quality within two (2) weeks after installation.

MABR - An Innovative Solution For Resilient Wastewater Treatment

J. Peeters, D. Christenson, D. Houweling, Dwight, A. Shaw, L. Stadler. SUEZ Water Technologies & Solutions (Canada)

Climate change is resulting in more challenging conditions for wastewater treatment plants, including extreme flow and load events, large variations in temperature and the risk of process upsets such as extended power outages. Resilient treatment solutions are an important component of managing this new reality. The membrane aerated biofilm reactor (MABR) is an innovative biofilm treatment technology that has unique features that make it resilient to peak flows, temperature change, and shutdown events. In this paper, the authors discuss and present evidence that the unique features of an MABR make it more resilient than conventional treatment. Data from a pilot study and a full-scale MABR installation are analyzed to demonstrate the resiliency of the technology. Future work includes side-by-side testing of MABR, moving bed biofilm reactor (MBBR), and conventional treatment under high-flow conditions. This work will be started in early 2020.