# Supplementary material

### Cleaning procedure for membrane plant

The membrane plant was cleaned before and after each filtration process. The three step cleaning procedure consisted of: (i) a solution of 1% enzyme/caustic Ultrasil™-69:67 in a 1:2 ratio (Eco lab, Saint Paul, MN, USA), (ii) a 1% aqueous solution of Ultrasil™-78 (nitric acid) (Eco lab) and (iii) a 2% aqueous solution of P3-Ultrasil™-115. Each cleaning solution was recirculated for 15 min at 45–50 °C, followed by flushing with RO water for 15 min at each step. Clean water flux was measured before and after the filtration, using reverse osmosis water under operational conditions for the MF processes, to ensure the membranes were sufficiently cleaned.