



## Promoting on-site urban wastewater reuse through MBR–RO treatment

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### ABSTRACT

A compact membrane bioreactor and reverse osmosis (MBR–RO) system was installed and set in operation in KEREFYT, EYDAP, in order to assess the potential reuse applications of the reclaimed water. Practicing the sewer mining (SM) approach, the feed of the unit was directly drained from the sewage network. Monitoring of system's performance was performed through a series of lab analyses and online measurements. According to the results, it is concluded that both MBR and RO effluent present very high quality characteristics. The RO effluent's quality in terms of organic content (0.9 mg/L BOD<sub>5</sub> and not detectable total suspended solids), ammonium nitrogen (0.25 mg/L), turbidity (0.32 NTU), *Escherichia coli* (not detectable) and total coliforms (not detectable) could fully meet the water quality requirements for reclaimed water, as dictated by the Greek legislation. Furthermore, the application of SM practice through the implementation of an on-site compact treatment system consisting of a pretreatment unit followed by an MBR and a UV disinfection unit can reliably meet all the national and international criteria set for all types of non-potable wastewater reuse at a rather moderate cost. The addition of an RO unit is fully justified in the case of saline wastewater and/or in cases where strict limit values for heavy metals and micropollutants in the reclaimed water have been set.

**Keywords:** Sewer mining; Water reuse; Wastewater reclamation; Membrane bioreactor; Reverse osmosis; Emerging contaminants

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