USE OF MEMBRANES FOR WATER TREATMENT – PERFORMANCE AND PERSPECTIVES

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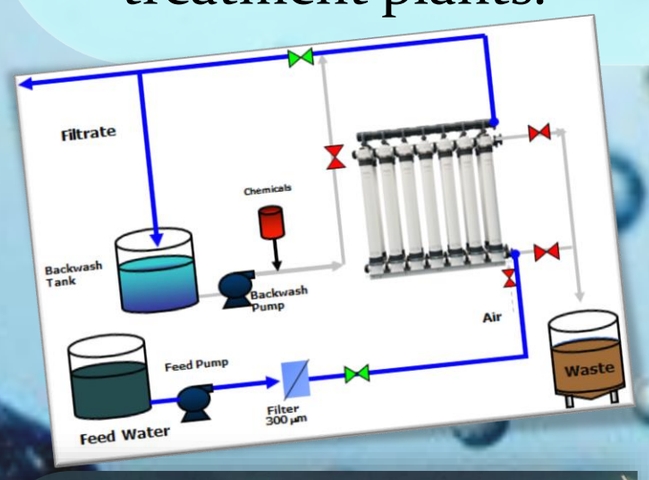
Introduction

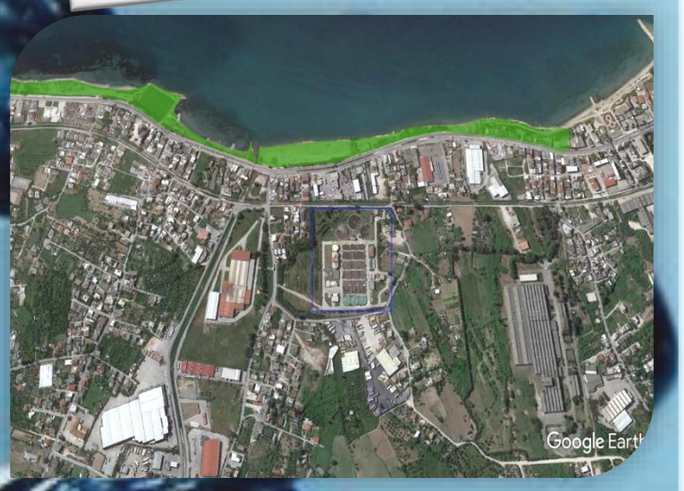
Removal of contaminants in water is required to prevent human health and to ensure good quality of drinking water. Moreover, climate change brings frequent and prolonged droughts. In the light of such water scarcity, engineers are focused on safeguarding water supply. Recently membrane separation processes is used as support or replacement for traditional water (depth filtration) and wastewater treatment technologies delivering potable water of best quality with less land requirements for infrastructure and reducing or even eliminate the use of electrolytes and/or polyelectrolytes.

Field Performance Study

A membrane ultrafiltration pilot system can prove capable to :

- ✓ ensure excellent removal of suspended materials (colloids, solids, bacteria, Cryptosporidium and Giardia, etc.).
- ✓ the filtrate stream be suitable for irrigation without restrictions according to Greek and E.U. legislation, as a post-treatment stage in the effluent of the activated sludge process.
- ✓ achieve complete retention of solids and of the COD contained in the activated sludge process effluent.
- ✓ have small land requirement, easy upgrade and modernization of old sewage treatment plants.





Results

South municipal park near Patras sewage treatment facility with a total surface of 50,000 m² will be irrigated using the treated water from UF membranes.

Laboratory Evaluation Study

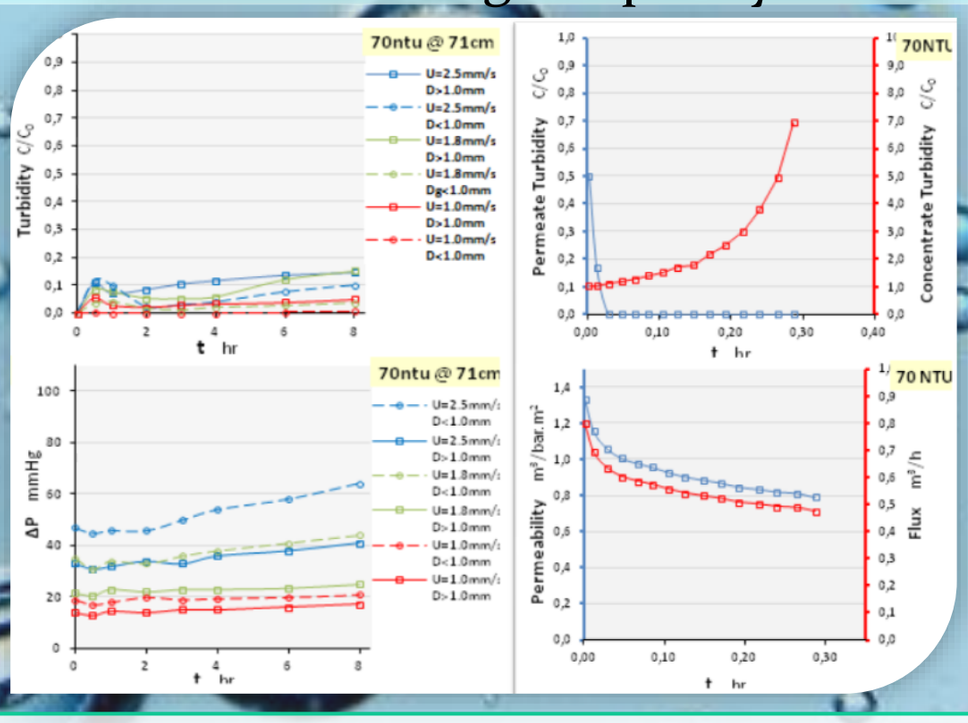
Aqueous solution was used to simulate the turbidity of the Glafkos River surface water in experiments both with membrane and depth-sand filtration.

Sand column apparatus:
diameter: 90mm,
filter height: 1500mm;
grain sizes 0.6~1 & 1~1.4mm

UF device:
ceramic, length: 1020mm,
pore size: 100nm,
surface area: 0.24m²

Results

- ➢ In deep sand filtration experiments, the surface loading of the filter affects strongly the process and the filtration capacity is a decreasing function of the flow rate.
- ➢ UF unit gave excellent separation capabilities, yielding permeate stream with characteristics of higher quality.



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