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"RO / NF applications in brackish groundwater desalination: Membrane characterization"

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Abstract

Water is an essential requirement for all forms of life, and an inseparable part of every ecosystem and many industrial processes. According to the Worldwatch Institute, more than two-thirds of the world's population may experience water shortages by 2025. This affects practically every country in the world, including the developed, unless they reduce demand and/or develop additional water sources. Water sources include oceans, brackish waters, the most common source in New Mexico, and wastewaters. The most common brackish water quality problems are caused by suspended solids and hardness. Both problems respond to inexpensive treatment methods. Reverse Osmosis (RO) is one of the technologies used for desalinating brackish and saline waters to provide drinking water. RO treatment plants use semipermeable membranes and pressure to separate salts from water. RO systems typically use less energy than thermal distillation, leading to a reduction in overall desalination costs, and allowing new brackish groundwater desalination facilities to use RO technology much more economically than distillation. Hence, this study improves the benefits of using RO by reducing the cost, time, and energy spending to find the best approach for different conditions. It focuses on characterization of different types of membranes used in RO systems by testing effects of Temperature, pH, Conductivity, and Recovery on product. The objectives are accomplished by utilizing pilot plant experiments. A huge database collected from a full pilot-scale system, located at the Brackish Groundwater National Desalination Research Facility (BGNDRF) in Alamogordo, and operated by New Mexico State University are analyzed.

Biography

Ghazaleh Vaseghi is an international student from Iran. She has completed her Master's at the age of 26 years from New Mexico State University. Her Bachelor degree is also in Chemical Engineering from one of top five universities in her country. Working on pilot scale reverse osmosis for her Master's thesis, she has experienced industrial aspect of studying water treatment. Her goal is to pursue working on water desalination during her Ph.D. studies.