



Management of BWRO systems using long-term monitoring of feed water quality to avoid future membrane process failure

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ABSTRACT

Pumping of wells from aquifers that are used to supply brackish-water reverse osmosis (BWRO) treatment systems commonly causes increases of water salinity in time. Some key aspects of assuring operational security are the magnitude of the water quality changes to assure that treatment can continue without failure of the process, reduction in installed capacity, or the necessity to modify the process by increasing the operational pressure and changing the membranes. An example of a BWRO system that uses a leaky aquifer system as a source of feed water located in Florida shows that careful monitoring of the well water quality and individual well pumping rates over a 10-year operating period can be used to assess the projected long-term changes in water quality with regard to the treatment facility design. The total dissolved solids concentration of the wellfield began with an average TDS of 2,461 mg/L which changed over 10 years to an average of 2,855 mg/L. The variation in time is linear and the projected average change for the next 20 years shows that the average TDS for the current pumping rate will increase to 3,611 mg/L which is well below the design maximum TDS treatment ability of 8,129 mg/L.

Keywords: Brackish-water reverse osmosis; Leaky aquifer; Feed water quality change; Operational assessment; Monitoring

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