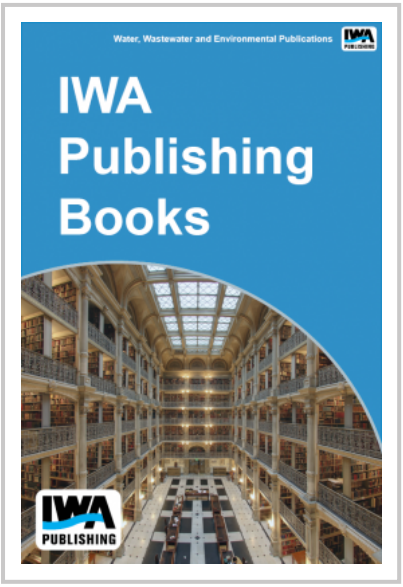
Pilot Testing of Membrane Zero Liquid Discharge for Drinking Water Systems



Increasing demand for potable water in Colorado has forced drinking water utilities to consider utilizing water from lower quality sources. These lower quality sources require the use of advanced treatment technologies such as reverse osmosis (RO) or nanofiltration (NF) membranes to treat the water to a level suitable for human consumption. At present, drinking water utilities within Colorado have been reluctant to undertake RO or NF membrane projects due to the uncertainty surrounding the availability of feasible disposal options for the concentrate. Concentrate (brine) minimization and zero liquid discharge (ZLD) are disposal options that may present a long-term solution to concentrate disposal for utilities that need membrane treatment to produce safe drinking water. A pilot test demonstrating concentrate minimization and ZLD will help address the technical and financial uncertainties which currently hinder the implementation of membrane technology.

A multi-step screening approach was used to select concentrate minimization and ZLD technologies for evaluation. Using the 2007 Report of the Colorado Water Quality Forum's Membrane Treatment Working Group (MTWG) as the point of departure, a comprehensive literature review was completed and published. This review identified 27 different technologies for brine minimization and disposal. Seven of these technologies were carried forward for additional screening to determine their suitability for pilot testing. The technologies were ranked using eight different criteria measuring factors such as potential level of performance, maturity and suitability for use in Colorado. As a result of the rankings a new technology, electrodialysis metathesis (EDM), developed by the Center of Inland Desalination Systems at the University of Texas El Paso, was selected for pilot testing. This technology is integrated into a process called Zero Discharge Desalination (ZDD) being commercialized by Veolia Water.

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