

# Managing Water with Membranes

By: By Jim Keller

Population growth and economic progress in many parts of the country are stretching available water supplies. Hundreds of new homes, schools, shopping centers and water-consuming industries, like car washing, create demand for additional water sources. The burden facing municipal water authorities across the nation is ensuring there is sufficient supply of this diminishing resource.



Severe drought conditions across several states in the South and Southwest provided a wake-up call that water would reach dangerously low levels within a short, five-month period. Environmental decisions are now dancing a fine line, as officials try to quickly create conservation programs without throwing up roadblocks to developers and road-closure signs to the general public.

One of the problems I have observed during the last 30 years is the creation of temporary programs, which are enacted just long enough to get municipalities to the next rain. Once water levels are restored, programs designed to make us warm and comfortable are unceremoniously dropped, along with the threats of fines and any signs of conservation enforcement.

I honestly believe that most operators in our industry do not live in a fairytale land thinking water authorities and politicians will take care of our water-supply issues. We need only look back a few years ago when the population in many areas doubled, and water storage, delivery and sewer treatment were still at a 1970's capacity. If you need proof of this, ask your local water and sewer authority to define the word "impact fee," past and present.

In most cases, carwashes do their part to save water in their communities by cleaning vehicles with less water than conventional driveway washing. Reusing large amounts of water, providing lower demand on sewer treatment facilities and trapping solids from entering sewer lines and lift stations are just some of the benefits of professional carwashes.

The solids that are washed off at carwashes are collected and hauled off at the expense of carwash owners. Solids that are washed off in driveways enter storm sewers and become a burden for the community to maintain.

Going forward, operators may want to consider membrane technology, a new, non-traditional approach to saving water that may also provide carwashes with an image boost in their communities. Although relatively new to the carwash industry, membrane systems have been used extensively to clean water for reuse in hundreds of industrial applications, including floor cleaning, metalworking, aqueous degreasing, tank reactor cleaning, parts washing, railcar cleaning, pressure washing, tannery baths, landfill runoff, bilge water in ships and many other applications more demanding than washing cars or trucks.

Membrane filtration provides a physical barrier to separate and concentrate suspended solids, oils, greases, waxes and odor-causing biological contaminants. The clean water produced from membrane filtration can be fed into reverse osmosis (RO) systems to produce spot-free water.

Ultra-filtration membranes have pores measuring approximately 0.01 micron, which is small enough to remove almost all bacteria, viruses and suspended solids.

Systems can be used exclusively or combined with conventional reclaim systems for wash and preliminary rinse, or blended with fresh water to feed RO spot-free systems.

Con-Serv's New Source Membrane systems are relatively big (11 feet long, 15 inches deep and 20 inches wide); however, membrane packs can be mounted from roof supports on walls in vertical or horizontal positions. Packs contain 12, 18 or 24 tubular membranes.

Membrane systems offer a modular design for easy handling. They also do not require chemical additions and can operate in a wide PH range. Other advantages include a minimum of moving parts (basic re-circulation of dirty water is run through the hollow tubes), and low energy utilization means no temperature adjustments on the raw feed water.

Membrane filtration is based on a process known as cross flow, or tangential flow, where the direction of the feed stream flow is parallel to the membrane surface. The turbulent flow of the pumping helps keep the membrane clean.

The permeate, or clean filtered water produced from the membrane system, can be combined with fresh or rejected water from the spot-free rinse equipment and can be used as wash or pre-rinse quality water. In some instances the cost of incorporating the membrane system could offer an alternative to paying higher sewer connection fees.

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