

# City of Flagstaff Solves Drinking Water Filtration Problem

The City of Flagstaff distributed approximately 2.87 billion gallons of water in 2001. The city prides itself on its high-quality, safe drinking water that exceeds all federal and state standards set by the Environmental Protection Agency (EPA) and the Arizona Department of Environmental Quality (ADEQ). Last year, the city conducted 3,670 tests for 141 contaminants and did not detect any contaminant levels higher than the EPA or ADEQ allows. There were zero violations of the Safe Drinking Water Act during 2001.

The maintenance of clean, safe drinking water is not without its challenges, of course. The City of Flagstaff is supplied by surface water from Upper Lake Mary and the Inner Basin of the San Francisco Peaks, as well as groundwater from several wells. Three years ago, two of the wells were producing sand and entrained gasses. To remove the gasses, the city bought membrane degasification equipment. However, the sand from the wells caused the membranes to tear and clog, requiring the use of filters in order to remove the sand and preserve the costly membrane equipment.

"We originally bought cartridge filters," says Jack Rathjen, production supervisor, "and ended up replacing them ad infinitum. Each filter had about 50 wing nuts on top and there were about 100 filters. Once a week, we had to go in and unscrew 5,000 wing nuts, take the filters out, and manually clean them with a garden hose. It was tedious and cumbersome and required lots of staff hours. It was very labor-intensive and not at all cost-effective. Eventually we'd get frustrated and replace the filters." Rathjen was replacing 100 cartridge filters every two to three months at \$13 a pop. Between labor and replacement expenses, the costs added up.

In search of a better solution, Rathjen turned to the Internet, where he discovered Tekleen® ( ) water filters. After reviewing the features on the Web site, as well as a more comprehensive CD-ROM sent to him by the company, Automatic Filters, Inc., Rathjen took the plunge and bought four Tekleen filters model ABW4-LP with 10µ screen and 5 square feet of screen area in each filter providing less than

1 psi pressure drop on a clean screen at 200 gpm. He had considered doing a pilot study but decided to go ahead and purchase the filters based on the information he received. Since then he's been very happy with the result, citing minimal downtime and minimal labor costs.

The Tekleen continuous-cleaning filters require little maintenance and do an excellent job of filtering the water. As dirt particles collect on the screen, the line pressure at the filter outlet drops. When the pressure reaches a preset differential, the backwash cycle begins. Within seconds and without interrupting the main flow, vacuum nozzles aggressively suction the dirt from the inside of the screen.



The Tekleen inline full flow automatic filter is the best solution in cleaning dirty water and preventing unscheduled shutdowns for maintenance and cleaning.

Rathjen purchased two filters for each well in order to maintain good water pressure. Because the sand was so fine, it required the smallest filter available, 10 microns. "Each unit is good for 200 gallons per minute. Our well is 350 gallons per minute," says Rathjen.

Having two 10-micron filters on each well completely removes the sand, allows for good water pressure, and, above all, lessens the expense of filtering the water and maintaining the membrane degasification equipment. Once every three months or so Rathjen gives the screens an acid bath to remove the buildup of calcium carbonate. This extra maintenance step results in less frequent backwashing and maximizes the effectiveness of the Tekleen filters.

"Overall, the filters do what we bought them to do," says Rathjen, "which is to get the sand out and protect those membrane contactors. The original filters didn't work. They plugged up and were very labor intensive. The Tekleen filters involve minimal downtime and minimal labor costs."