High Efficiency, Low Flow

By Rebecca Wilhelm

The No. 2 well site in the village of Suring, Wis., a community of 508 located in the northeastern part of the state, was previously restricted from use for drinking water due to high arsenic concentrations, averaging 12 parts per billion (ppb), just above the U.S. Environmental Protection Agency's (EPA) maximum contaminant level (MCL) of 10 ppb. A high-efficiency, low-flow ion exchange system designed specifically for small systems provided a solution.

The value of low waste and utilization rates

There was no prior treatment at the No. 2 well, but after being shut down because of high arsenic, the village decided to rebuild the pump house and put in new equipment.

"We've also had high iron at that location," said Leslie Steffeck, Suring's director of public works. "We thought since we were going after one, we might as well alleviate another problem."

As a small municipality, it was hard to find an affordable solution. After pilot testing from two companies, Steffeck said Suring settled on Envirogen.

Custom Opportunity

The MinX system from Envirogen starts with ion exchange technology packaged in a system that is specifically designed to handle low-flow applications with high efficiency and low overall costs—both from an operating standpoint and a waste management standpoint. It is designed specifically to handle flow rates ranging from 35 to 500 gal per minute (gpm), and is suitable for removal of a range of contaminants.

The market for small system treatment options is dominated by off-the-shelf systems, but the MinX offers a site-specific, reliable, low lifecycle cost treatment option to smaller municipalities like Suring—offering smaller operators a custom-fit technology alternative.

"By offering pre-engineered and packaged modular systems that achieve reliable, low-cost performance for the smaller utility, we hope to bring state-of-the-art drinking water treatment technology to a previously underserved sector of the municipal drinking water treatment community," said Rob Loken, vice president, Great Lakes region, for Envirogen.

The new MinX system for Suring operates at 225 gpm and removes arsenic from groundwater at the No. 2 well site. The treatment goal of this system is less than 7 ppb arsenic. In addition, if the EPA further reduces its arsenic MCL to 5 ppb, as is currently under consideration, the system easily can be adjusted to meet this or even lower effluent requirements.

"We should be between one and zero micrograms per liter for arsenic," Steffeck said, "and iron should drop from 0.45 parts per million (ppm) to below 0.3 ppm."

The unusually low waste rate possible with this system design and the low utilization rate (pumping hours per day) were deciding factors in its selection at the Suring site, according to Steffeck. In a comparison to a coagulation-filtration treatment scheme, also piloted at the same time, the MinX system was able to treat the arsenic below the MCL in repeated startup and shutdown tests, and produced less waste, with no operator interface. Since the site does not offer a drain to wastewater treatment, the waste generated will need to be collected and stored on site.

The Envirogen system will produce a waste rate of less than 0.002%, or 0.2 gal per 1,000 gal of water treated, resulting in very low costs for waste handling and disposal. In addition, the MinX counter-current packed bed process features a high-capacity media bed and offers a long period of operation before regeneration service is required.

One of the major challenges of the project was funding. Sources of funding included a loan from the Wisconsin Department of Natural Resources' Safe Drinking Water Loan Program, stimulus money and a community block grant, as well as matching funds from the village. "Without those funding efforts, we wouldn't have been able to do it," Steffeck said.

According to Loken, the MinX line of treatment systems is part of a push to provide superior treatment solutions to customers of all sizes. *wqp*

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