Drinking Water

Municipality of Saint-Irénée, Quebec

$NanH_2OFiltration$, Membrane Filtration

SITUATION

Since the 1960s, the municipality of Saint-Irénée used the Saint-Antoine creek's water to feed its aqueduct system. The implementation of new drinking water regulations in the 2000s led the municipality to reconsider its drinking water production method.

In 2008, after ensuring that the creek remained the safest water source, the municipality sent invitations to bid on the new drinking water production system.

Three technologies were proposed:

- Ozonation and slow sand filtration
- Membrane filtration through nanofiltration
- Membrane filtration through ultrafiltration and ozone

Based on the bids received, the nanofiltration solution proposed by H_2O Innovation, North American leader in the design of high-performance water treatment solutions, proved to be the most adequate in terms of performance, quality and life cycle cost for the municipality of Saint-Irénée.

TREATMENT SEQUENCE

H_2O Innovation's $NanH_2Ofiltration$ system, which uses membrane filtration for surface water treatment, includes two pre-treatment steps. First, the creek's water is filtered through five disc filters used to eliminate particles larger than 55 microns. Second, the water is pushed through four multimedia filters to reduce suspended solids.

Once the pre-filtration is completed, the water enters the main component of the system: the nanofiltration (NF) unit where it's pushed through nine parallel vessels, each containing six membranes. After exiting the NF unit, the water runs through a UV sterilization system. The amount of rays deployed by the system ensures the complete elimination of any pathogens that could have resisted the previous filtration steps.

To finish, just before reaching the aqueduct system, the pH level is adjusted and a small quantity of residual chlorine is added to the water to prevent post contamination in the pipe network.

CLEANING

When the inlet and outlet pressures of the disc or multimedia filters reachers a certain differential, the system automatically triggers a backwash. The backwashes developed by H_2O Innovation are clean enough to be discharged in the environment without further treatment as they are free of any chemicals.

The nanofiltration unit also has its own membrane cleaning cycles. When membrane fouling exceeds a certain level, the system's operator prepares a cleaning solution and launches a semi-automated cleaning cycle by using the control panel's touchscreen.

KEY STRENGTHS

- The drinking water production plant is compact and has a very limited footprint.
- The NanH_2Ofiltration system ensures a consistent high-quality treated water, whatever the raw water parameters are.
- Produced flow: 815 m^3/d (150 gpm).
- 66% recovery rate.
- The system was commissionned in the fall of 2009, less than a year after the opening of the bids.

1. Multimedia filters and NF system at the back
2. Arkal disc filters
3. Multimedia filters

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