



IDENTIFYING EXCESS WATER IN SEWER SYSTEMS IS CRITICAL



The wettest year in Michigan is behind us, but the full impact on your community's sewers and wastewater treatment systems may not be known until later this spring or summer.

Wet weather and high groundwater can raise havoc for municipal leaders trying to keep excess clear rainwater or groundwater from coming into the sewer system. The excess water can be very expensive to handle because it uses capacity of the sewer piping and treatment system. If the sewers can't handle the flows, backups into basements and overflows are possible.

In addition, the excess flows may affect the quality of treatment at your plant or cause overflows of partially treated wastewater to your nearby lake or river creating health hazards and costly permit violations. Failure to get the water out of the system can force communities to install bigger sewers and expand the wastewater plant.

Onkama Village officials last year worked on alleviating concerns that the water that doesn't need to be treated isn't overloading their collection system and wastewater treatment facilities. They took advantage of the SAW Program (Stormwater, Asset Management and Wastewater Grant Program) to evaluate their infiltration and inflow (I/I) issues.

"We wanted to get a pretty good picture of our system," said Bob Gronostalski, Onkama's maintenance technician. "We needed to know what's actually going on inside the pipes.

"It was a tough year because our lake water levels were so high and breaching the seawalls and our groundwater was so high. You only had to dig about a half foot down and you got water."

THE RIGHT TOOLS ARE NEEDED TO STUDY I/I

Accurately identifying the source of excess water, known as infiltration and inflow (I/I), in sanitary sewers can be frustrating, time-consuming and costly. But identifying the leaks is critical. Reducing your I/I can result in large overall savings in pipe size, future treatment plant capacity and operational costs.

Some of the tools used to locate I/I include performing manhole assessments, smoke testing, closed circuit televising (CTV) and mass flow monitoring (MFM).

- Manhole field inspections identify structural defects and leaks within the manholes. A comprehensive assessment can usually be completed at the top of the manhole without entry.
- Smoke testing is a relatively fast, economical and effective method of identifying rainwater coming from cross connections. An odorless, nontoxic smoke is pumped into the sewer system to locate damaged or improper connections like a catch basin connected to the sanitary sewer or a broken sewer lateral clean-out cap.
- Televising an entire sewer system can be expensive but televising a small amount at a time and prioritizing suspect areas provides insight into what causes any backups or blockages. The data can be stored in the sewer system GIS and updated as you complete future inspections.
- MFM is a cost-effective, specialized technique utilized by Fleis & VandenBrink (F&V) staff that uses flow monitors installed in many manhole locations. It is much less expensive than the cumbersome metering equipment used in the past and provides data at more locations compared to installation of a few expensive flow meters.

"One of the big benefits of MFM is that it's not intrusive to residents and it's quicker and easier to do," Gronostalski said. "You can definitely minimize the areas to be tested, affecting less people. MFM is a great advancement in technology."

With MFM, flow monitors can be easily moved to further refine hot spot areas in the sewer system and no 'confined space' entry is required, making the process of installing the monitors much safer.

Lift station flows and site rain data are also incorporated as part of the data for the analysis. Results can be used to prioritize additional field investigation.

Spring is an ideal time to study your infiltration and inflow events as the groundwater is high due to snow melts and/or typical heavy spring rains. If you need help developing a strategy to reduce the cost of the high rainfall impact on your sewer system, please contact F&V's Elaine Venema at evenema@fveng.com or at 800.494.5202.

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- Bob Gronostalski, Onekama's maintenance technician



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