By Charlie Schwindamann, Wastewater Tech

Wastewater Systems Should Not Be "Out of Sight – Out of Mind"

This photo shows a sanitary sewer overflow. It was discovered by a nearby resident due to the odor of raw sewage. The city responded and reported the overflow to Kansas Department of Health and Environment as required.

I know that most people have heard the expression "Out of sight – out of mind!" many times. Unfortunately, when I discuss collection system upgrade and repairs with many operators, they frequently mention that this is exactly the attitude their city councils have about the water distribution and wastewater collection systems. Many council members do not seem to appreciate the fact that most cities in Kansas installed their water and sewer systems prior to the 1960's. I know of a system in Kansas that was installed in the 1910's. It had a major upgrade in the 1950's and another in the mid-1990. Although the upgrades were primarily to the treatment plant and new extensions of the collection system, it wasn't until the about ten years ago that any serious thought was given to improving the "existing" collection system.

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In the timeline referenced above, almost one hundred years passed before any improvements were made to the collection system. I believe this was due to the "out of sight – out of mind" mentality that seems so common. It took the flood of 1993 to open the eyes of that city council and it was only then because of lawsuits due to sanitary sewer backups into homes. In the early 2000's, the city developed a plan to rehabilitate manholes in the first phase of their improvement plan. This required nearly five years to complete. The city is now working to line or replace much of the remaining collection system. They have been aggressively cleaning the collection system and using closed circuit televising to locate problem areas. Although this city has a "plan" to upgrade their collection system, it is not formalized. If new council members are elected, the plan could be scrapped.

"Been there, done that!"

I want to provide an example of a collection system KRWA smoke-tested twice in my eleven years working for KRWA. The city serves a population of 800; there are approximately 320 service connections. The city has two full-time employees to take care of the water, sewer, streets and other city properties. The first smoke test was completed in November 1999. In partnership with the city operator, we identified 114 problems with the collection system. These ranged from main and service line breaks to problem cleanouts and manholes that needed attention to prevent inflow and infiltration. The second smoke test was completed in September 2010; in that project, we identified 130 problems. Here's the kicker: The majority of the problems identified in September 2010 were the very same problems that were identified in November 1999. As we smoke tested and videotaped problem areas, I recalled some of these locations and I could predict the exact locations where smoke would appear. I need to mention that current city personnel were not employed by this city back in 1999. With the change in personnel and probably several (if not all) council members since 1999, the problems we had identified were indeed "out of sight – out of mind."

The reason for the smoke testing this system was excessive inflow at their main lift station during rain events. This excessive flow can hydraulically overload the lift station, resulting in raw sewage discharges onto the ground. It could also result in effluent violations as the excessive

This photo shows excavation of an 8-inch sewer main that had a blockage; a sewer machine could not clear the blockage. Tree roots had penetrated this sewer line, resulting in a complete blockage. The blockage was removed, reestablishing flow. This line was replaced as soon as the city obtained materials.

flow likely exceeds the hydraulic design of the treatment plant. Consequently, plant detention time is severely decreased which can adversely affect effluent quality. Several of the problems we found in both tests were either storm sewers illegally connected to the sanitary sewer system or service lines and main lines crossing drainage ditches.

Subsequent to the recent smoke testing, the city videotaped all the mainline sewers where the most significant problems were located. The operators and I reviewed the tapes to determine a plan of action to correct the problems. At times it is advisable to videotape the entire collection system rather than only segments, in case smoke testing did not find all the problems. Smoke testing is a very good method to use to evaluate a collection system and to find the most significant causes of inflow and infiltration. However, it will not locate all problems due to soil types and water table depths. Those factors can prevent the escape of smoke from a broken service line or main.

Piecemeal, or big project?

Two options were provided to correct the problems. The options were: 1) develop a plan to repair several hundred feet of sewer each year in a phased approach; or, 2) correct all problems as one larger project. The advantage of repairing several hundred feet per year is that the system may be able to finance the repairs within its existing budget. The disadvantage is that changes in either personnel or the city council may redirect attention and funding to other projects, with the collection system no longer being the highest priority.

A broken piece of clay pipe can be seen in the inlet pipe.

The second option, to repair all problems at once using loans or possibly grants, would allow for repairs to the entire system. Option two would require engineering services, but having an experienced consultant onboard can also provide invaluable assistance in prioritizing the projects.

Presently, the city is opting to have city personnel repair the problems they are capable of and employ additional help as needed. They have replaced a clay pipe that had excessive tree root growth. Other repairs will likely require an outside contractor with equipment and expertise the city does not have. And, the city has no shoring equipment to ensure the safety of workers. The city also has only two operators to tend to everything else in town including their water treatment plant and distribution system, the wastewater treatment plant and collection system, as well as taking care of all city streets.

Since writing this article in mid-January, its likely the city's priorities have switched to snow removal for the rest of the winter. Next comes preparing the swimming pool for the summer season. Hopefully the city council will not lose sight of the need to continue rehabilitating their collection system. Otherwise, unfortunately, the collection system may again become "out of sight – out of mind." I sure hope not.

If your city or wastewater system has challenges, I hope that you will consider attending the annual KRWA conference, March 29 – 31 at Century II Convention Center in Wichita. There is no other conference in the Midwest that offers the range of technical sessions and as large a display of water and wastewater products and services. It's a small investment of time that will surely pay big dividends. The program is reprinted in this issue and it is also posted online at www.krwa.net. Hope to see you there.

Charlie Schwindamann has been Wastewater Tech at KRWA since September 1999. Charlie holds Class II Water and Class I Wastewater Operator certification. He is a member of the Marysville, KS City Council.