

# Not addressing collection system problems perhaps costly for city of Emmett

Systems can often find themselves in trouble with the Kansas Department of Health and Environment (KDHE), or US EPA, for not following through with corrections of known problems on their sanitary sewer systems. The issues can be as simple as not providing discharge permit monitoring results to KDHE within required timeframes to the more complicated process of correcting inflow and infiltration (I&I) or making other system upgrades.

Complying with rules and regulations is sometimes considered routine, such as meeting deadlines. If the sanitary sewer system's wastewater permit says that the report is due by the 28th of the following month or quarter – then just send it! If it's the lab's fault for not getting the information to the utility – obtain the service of a new lab! Those are relatively easy and straightforward responses.

My goal in this article is to make readers aware of the more complicated compliance issues. In this case, I'm going to use the city of Emmett, located in Pottawatomie County northwest of Topeka, as the case study. I am familiar with Emmett and the issues there; the scenario Emmett faced is likely similar to many other wastewater systems in small towns across Kansas.

Emmett had an inflow and infiltration problem. Their two-cell lagoon system discharged during periods of wet weather. At the city's request, KRWA conducted a smoke testing of Emmett's sewer system in September 2005. A total of 55 problems were identified, including 19 uncapped cleanouts, 7 manholes that allowed inflow, 17 service lines that needed to be capped and several other problems. As an average based on KRWA's experience, the number of problems identified by Emmett's smoke testing was an extremely high count for a town with only 270 people.

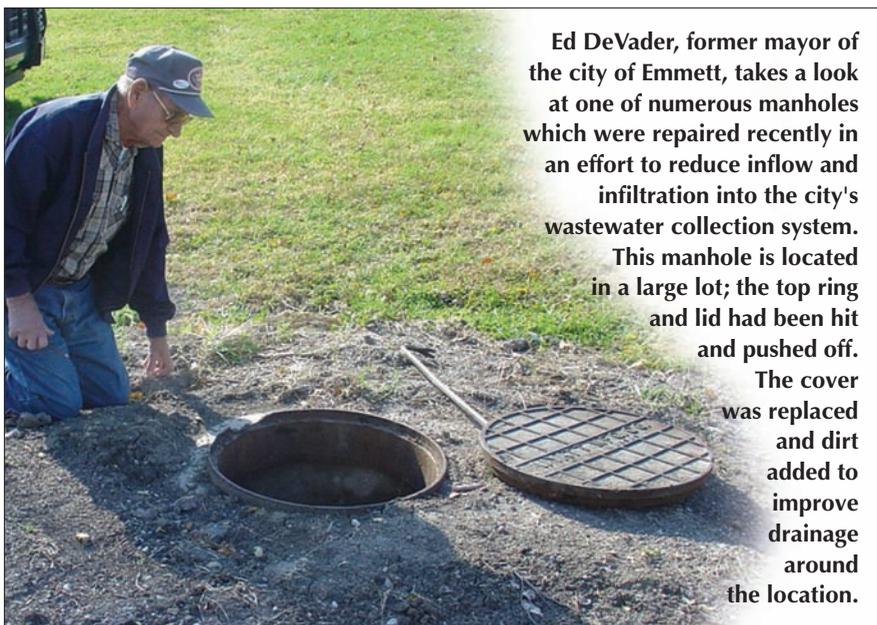
The city has a Non-Discharging Wastewater Permit issued by KDHE. As I mentioned, the system is a two-cell

lagoon system. But Emmett has frequently had to discharge from the lagoon, obtaining necessary permission from KDHE each time. Discharges have been more frequent in recent years. Emmett monitored the lagoon effluent using the same permit requirements as other discharging systems. Emmett had reported that it corrected all the problems

identified in the 2005 smoke testing. So it was logical to assume there were additional problems. Due to these frequent discharges, KDHE sent the city an Administrative Order requiring Emmett to hire an engineer and correct deficiencies in the collection system. The order also required the city to add a third lagoon cell and to then obtain a Discharging Permit.

Consequently, the city again contacted KRWA to smoke test the collection system to check for problems. I conducted the smoke testing in September 2008. Operator Amy VandeVelde provided assistance. The smoke testing revealed 58 problems. Ironically, most of the problems were found at the same locations as those found in 2005. These included 9 cleanouts, 10 manholes that allowed inflow and 35 service lines that needed to be capped.

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Ed DeVader, former mayor of the city of Emmett, takes a look at one of numerous manholes which were repaired recently in an effort to reduce inflow and infiltration into the city's wastewater collection system.

This manhole is located in a large lot; the top ring and lid had been hit and pushed off.

The cover was replaced and dirt added to improve drainage around the location.

## A \$1 million project

KRWA General Manager Elmer Ronnebaum learned of an improvement project proposed for Emmett at an estimated cost of \$1.059 million. The engineering estimate anticipated financing 55% of the total project costs using grants from the Kansas Department of Commerce and Rural Development. However, the remaining 45% of the costs (\$462,000) was to be financed with a 40-year Rural Development loan. The annual debt payment to the city for the 40-year loan at 3.625% interest was projected at approximately \$22,000. If both grants were not awarded, the city's yearly debt payment would be even greater.

KRWA questioned why the city of Emmett would be applying for grants and loans to fund such a project when the problems identified in two previous rounds of smoke tests had not been corrected. Would the third cell even be necessary if the leaks were corrected? Elmer and I wondered if Emmett should be saddled with potentially unnecessary long-term financing and expending grant funds on problems that might not be addressed. I mentioned that it might be possible to correct the inflow and infiltration problems and that a third cell may not be needed. Obviously, time would be needed to monitor the lagoon discharge status after eliminating all identified inflow sources.

This seemed like a logical solution. But the problem was that the city was already under an order from KDHE to make the improvements. Plus such projects generate momentum by all involved parties, including KDHE, the city and the city's engineer. Nevertheless, the direction in which this project was headed didn't seem completely right. Adding a third cell would be expensive and sure seemed like overkill since the city had only discharged after periods of heavy rainfall.



This photo shows a 4-inch service line that had serviced a trailer court which has not had a trailer for more than 10 years. But note the obvious flow line inside that pipe. The uncapped service connection in the trailer court were adding much additional rainwater to the collection system.

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Bob Blair, a local plumber, is shown repairing one of many unused service connections at a trailer court. Bob is very capable in spite of the loss of an arm.

## Taking a second look

After reviewing the proposed project, KRWA contacted both the KDHE district and state offices. We asked KDHE to consider allowing KRWA to assist Emmett in reducing costs. We proposed managing the project for the city if necessary – and to provide documentation to KDHE that the problems identified were corrected. We contacted the mayor and also attended a city council meeting to explain the potential costs to the city for not addressing I&I problems previously identified. The city agreed to have KRWA monitor and document the corrections.

As a result, KRWA again smoke tested the areas where problems had been previously noted. This time, the city was very aggressive in addressing the problems. After the corrections were made, including capping many open cleanouts, KRWA again smoke tested the entire system and parts of it up to five times to ensure that all problems had been corrected.

In late November, Ed Dillingham, KDHE Environmental Scientist, met with the city and agreed that the city should contact their engineer and divide the proposed project into two phases. Phase I will require replacing the influent lift station along with continuing to work on remaining collection system problems. This phase will also include televising the

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The 2009 KRWA annual conference features numerous sessions that will benefit wastewater utility operators and owners. They include the following:

- How to Troubleshoot Wastewater Lagoons (a 5-hour session on Tuesday, 3/24)
- Water Quality Standards
- SCADA Systems
- Wastewater Operator Forum and Exam
- Sampling Interpretation
- Kansas One Call



**This manhole is located in a low-lying area. It was raised and sealed to prevent inflow.**

sewer collection system. I have suggested maybe a multi-year schedule although they will need to evaluate the cost of doing it all at once versus having a televising company come multiple times. The city will also develop plans to set up an irrigation system for the lagoon, should it ever need to discharge in the future. Irrigating effluent would still allow the city to maintain a non-discharging system. The city had already purchased land for the proposed third cell that could be used for irrigating. Phase II will require constructing a third lagoon cell if the collection system corrections do not prove adequate in reducing infiltration and inflow.

There may still be some corrections necessary on the collection system. These include a new lift station; the present unit has no readily available hour meters at ground level and the structure constitutes a confined space. Sewer main replacement may be needed in other areas where smoke testing did not reveal any leaks. Smoke does not always appear due to depth or wet soil conditions.

My hope is that by addressing the inflow and infiltration problems, the city may not even need to irrigate. That would eliminate the need for the third cell – and with any luck, KDHE will allow the city to monitor inflow and infiltration for a year to determine if an additional cell is warranted.

I wrote this article in part to document this case but more so, as a reminder to other systems not to make the mistake of ignoring repairs that are needed. The original smoke testing identified many problems that could have been addressed at little cost. I smoke test many systems every year in Kansas; I am disappointed to find that some of the systems do not correct the problems that are identified. Many other communities however are aggressive with correcting the problems that are found.

I know some small system operators and council members say they cannot afford to correct all collection system problems at once; that's understandable. But sewer rates need to be reviewed periodically to ensure there is adequate funding to maintain the system properly. The budget also needs to provide necessary reserves for improvements. Rates may need to be increased to provide the necessary revenue. However, a few dollars a month in

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increased rates is easier to explain and defend than a rate hike of \$10 or \$20 a month if a large project is mandated.

I hope that Emmett can avoid constructing the third cell. I hope that their two-cell pond system does not overflow. Most of all, I hope that the city and other such small communities will work in partnership with state and federal agencies, and KRWA or other tech assistance providers to: 1) eliminate the problems; and, 2) reduce financial outlays. We all complain about the cost of taxes and government waste. The case here is that we all need to be accountable in our attempts to be responsible stewards of local, state and national assets and of course the environment which is the reason for the regulations in the first place.

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



CAUSES OF WASTEWATER BYPASS	
Bypass for Repair/Construction	Intentional bypass for maintenance or construction activities
Rainfall	Excessive rainfall, snowmelt, etc.
Construction Related Failure	Unplanned bypass related to damage from construction activities
City Line Failure	Line failure not caused by construction activities
Private Line Failure	Private sewer line failure for any reason
City Line Blockage	Blockage in the city line causing a wastewater discharge
Private Line Blockage	Blockage in the private line causing a discharge from the private line
Equipment Failure	Equipment breakdown
Control System Failure	Control system failed to start equipment or indicate an alarm
Power Related Failure	Loss of power to equipment including control/alarm system
Maintenance Related Bypass	Failure to provide timely or proper maintenance
Vandalism	Intentional equipment damage/adding illicit materials to collection system leading to a bypass
Lagoon High Level	Backing wastewater into a system causing a bypass overtopping a lagoon cell
Operations Related Bypass	Failure to provide timely and proper operations control - such as respond to alarms, failure to power up equipment, restrict controllable inflows, etc.
Spill	Spillage of waste, usually not directly from the system - such as during loading or hauling/disposing of wastewater or sludge



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