A NINE YEAR PROJECT IN GREENTOWN

Indiana Produces Large-Scale Capital Improvements

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INTRODUCTION

As cities grow and expand, the flow to water resource recovery facilities (WRRFs), formerly known as wastewater treatment plants (WWTPs), increases. Many times, if preventative measures aren't taken, the WRRFs can reach and exceed their capacity. What happens then?

When a treatment plant reaches or approaches 90% of it's hydraulic or organic design capacity, Rule 327 IAC 4-1-3 states that IDEM will notify the operator that a Sewer Connection Ban may be necessary. The Town of Greentown, Indiana experienced these issues during the past decade. Town officials engaged with Wessler to make major improvements to their collection and waste treatment systems.

The following case study is an overview of a project in Greentown, Indiana that began in 2005 and continued through 2014.

The Problem

Due to treatment violations at the WRRF, Greentown was issued a Sewer Ban in 1997 and an Agreed Order in 2006. Violations were a result of hydraulic overloading (too much flow going to the plant) and effluent quality violations (water leaving the plant wasn't clean enough).

The Impact

The Sewer Ban prevented additional sewer connections in the Town until the Ban was lifted. This likely prevented the development of at least one residential development, if not more, and also had long-term impacts on the future growth of the Town. Additionally, the Agreed Order carried the threat of financial penalties for failure to comply, leaving the Town with a looming financial burden that could not be overlooked.

THE SOLUTION

Wessler was hired (2005) to develop a plan to remove the Town from both the Ban and the Agreed Order. A comprehensive plan for compliance was developed and implemented, consisting of:

DETERMINATION OF NEED (2005)	 A. Wet weather flows due to excessive inflow and infiltration (I/I) from old sewers and private laterals. B. Poor treatment at the WRRF due to high flows and aging and undersized equipment and components.
ESTABLISHED OF GOAL (2006)	 A. Removal from the Ban and A.O. i. Reduce the amount of clear (i.e. rain) water reaching the WRRF = Sewer Improvements. ii. Improve WRRF process to ensure better treatment performance = WRRF Improvements.
SANITARY SEWER IMPROVEMENTS	 A. Review Historical Data (old maps, past project info, sewer separation records, interview staff) B. Inspect the Sewers (2006) Manhole Inspections – Visual Inspections of manhole conditions. Sewer Inspections – Video recording and evaluation of sewer pipe conditions. Smoke Testing – Blowing smoke in the sanitary sewer to locate leaks. W. Flow Monitoring – Measure the flow in the sewers during dry and wet weather to narrow-down the source(s) of inflow and infiltration (I/I). C. Develop a Project (2009) Data collected during the inspection phase was converted to a project was publicly bid (funding was IOCRA and open-market bonds). Cost of the project was approximately \$900,000. D. Measure Results (2010/2011) Flow meters were reinstalled to measure wet-weather flows after the sewer project was complete. Monitoring continued for more than a year, capturing several major rain events. The new flow readings were then used to size the WRRF improvements.
WRRF IMPROVEMENTS	 A. Design (2011/2012) i. Improvements were sized based upon post sewer project flow monitoring results. ii. Design flow was increased from 420,000 gallons per day (0.420 MGD) to 0.580 MGD. iii. Peak flow was increased from approximately 1.5 MGD to 2.85 MGD, with a peak pumping capacity of 4.0 MGD. iV. Existing structures were evaluated for reuse, half were unfit for reuse and would be demolished. B. Construction (2013/2014) i. Construction commenced: February 2013. ii. New WRRF brought online: January 2014. iii. Construction complete: August 2014.

The Results

WRRF effluent data was evaluated for the six months after bringing the new WRRF online (February – July, 2014) to determine effluent quality and to monitor for overflows related to high flows. The findings revealed that no overflows had occurred since bringing the new WRRF online, despite a couple substantial rain events.

Additionally, effluent quality during the monitoring period consistently met permit requirements. These results were submitted to IDEM in September 2014 requesting removal of both the Sewer Ban and Agreed Order. In November 2014, the Town finally received the good news, that after 9-years of planning and projects, the Town was officially released from both the Ban and the Agreed Order.

In addition, the Town has seen significant improvements in operations. Since the project's completion and monitoring, the Town has seen energy savings, a reduction in solids disposal costs, more reliable operation due to automation, and more efficient operation. Resources have been freed up, as well, giving employees flexibility to focus on other tasks.



OVERFLOW VOLUME (GALLONS)

Summary of the Graph

This graph shows the number of overflow events and the corresponding overflow volume of each event. These events are ultimately what led to the Sewer Ban and initiated the Agreed Order.

As shown in the graph, overflows were frequent and large when Wessler began work in early 2005. This continued until mid 2009 when the collection system (sewer) rehabilitation work was completed. Coincidentally, within weeks after completing the rehab work the frequency and volume of overflows began to diminish. Fast forward to 2011 and the number of reported overflows had all but been eliminated, with the exception of the major storm event that occurred in June 2013. This was the last recorded overflow event at the Town and was considered an exception given the rainfall volume. That brings us to the end of the project, where we see that the Town is released from the Ban and Agreed Order – the ultimate goal beginning just under 10 years prior.

Conclusion

Community leaders are tasked with finding solutions to regulatory and performance hurdles. The thought of tackling large-scale capital improvements can often feel overwhelming. In these situations, many times the quickest solution is preferred; the sooner the issue is addressed, the sooner the headache goes away.

However, poor planning and a rush to judgment may create recurring problems down the road. This costs more money and further burden on the administration and staff. A better solution is committing to the problem, planning for the future, and working collaboratively with your consultant. Together, you may find a long-term solution that may not happen in a month, year, or even many years, but will ultimately provide the long-term viability that all communities wish for.

Energy savings:

Electric bills from July 2013 through January 2015 show a significant energy savings. The data reflect an approximate 33% annual energy savings due to new plant improvements (approximately \$18,750 savings per year).



GREENTOWN WRRF - ENERGY CONSUMPTION

