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FIGHTING I&I AND OVERFLOWS

Connecticut utility lays out plan to eliminate overflows in its aging combined system

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PRODUCT FOCUS: STORMWATER MANAGEMENT



MDC





Susan Negrelli MDC Director of Engineering Hartford, Connecticut

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STORMWATER MANAGEMENT



ON THE COVER: Susan Negrelli, Metropolitan District (Hartford, Connecticut) Director of Engineering, has helped lead the district's \$2 billion combined sewer overflow mitigation program. (Photography by John Marinelli)









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FIGHTING I&I AND OVERFLOWS

Connecticut utility lays out plan to eliminate overflows in its aging combined system

By Traci Browne

FOCUS• SEWE

S ewer overflow issues finally came to a head for the Metropolitan District (Hartford, Connecticut) in the early 2000s.

The Metropolitan District, a nonprofit municipal corporation that supplies water and sewer services to eight member communities, has been saddled with Hartford's 150-year-old combined sewer system since it was established in 1929. The 100-year-old sanitary systems of the surrounding towns they inherited weren't in great shape either.

In the early 2000s, approximately 1 billion gallons of untreated wastewater overflowed annually into area streams and waterways, which caught the attention of the EPA and the Connecticut Department of Energy and Environmental Protection . The result was a 2006 federal consent decree and a state consent order calling for the complete elimination of overflows in the towns of Wethersfield, Rocky Hill, Windsor, West Hartford and Newington.

The MDC immediately launched a sewer separation project but it didn't take long to realize that sewer separation, in addition to being costly and disruptive, wouldn't get them to their agreed goal in time. They needed a different approach.

To meet the consent decree and consent order requirements, MDC put together a comprehensive plan they call the Clean Water Project. The CWP includes a program for I&I remediation, construction of storage tunnels and an interceptor, upgrades to the treatment plant, and the now-infamous sewer separation. PROFILE: The Metropolitan District (MDC) Hartford, Connecticut

AN ANY DE MANAGER

YEAR ESTABLISHED: 1929

EMPLOYEES: 450

213-MDC

ANNUAL BUDGET: \$196.9 million total / \$94.8 million sewer

CLEAN WATER PROJECT: \$2.5 Billion

INFRASTRUCTURE:

MDC treats approximately 30 billion gallons of wastewater per year at four wastewater treatment plants (Hartford Treatment Plant is the largest in Connecticut) and has 1,300 miles of sewer main in the collection system

ANNUAL BUDGET: \$48 million (operations)

POPULATION SERVED: 400,000 served and 100,000 customers

Above: Metropolitan District (Hartford) crew member Corey Patterson removes a manhole cover while he and Greg Spillman set up to clean a sewer line. (Photography by John Marinelli) (continued)





"We were ripping up half of Hartford — 700 acres at this point — and we were not going to make our deadlines."

Susan Negrelli

Sewer separation

While the MDC serves eight different municipalities, only Hartford has a combined system with brick sewers dating back to the 1800s. In addition to the typical connected roof drains, floor drains and the like, the sanitary flow from West Hartford, Newington, Weathersfield and Bloomfield all connects to and travels through Hartford on its way to the treatment plant. Condition issues in the sewer systems, and there are many in the connected communities, are exacerbating the problems in Hartford.

Susan Negrelli, director of engineering at the Metropolitan District, says they planned to go in and separate much of Hartford's combined system, starting with the large drainage areas and targeting certain overflows. The original CWP gave them 15 years to make the improvements necessary to achieve the level of control the EPA and DEEP were looking for.

"We were ripping up half of Hartford — 700 acres at this point — and we were not going to make our deadlines. We got an extension but still, [separation] was slow, it was disruptive, it was costly and we were running out of time.

Disruptive is an understatement. Some of the separation projects ran as high as \$40 million and took years to complete. The business district was where the MDC met the most difficulties because crews could be blocking business entrances for weeks at a time. Despite the accommodations made for access, Negrelli says the work had a negative financial impact.

"And frankly, it was getting expensive for us with replacing this one's driveway, and this one had a fence in the way, and that one had a big tree," she says. "When you deal with private property, it gets very costly."

Above: Susan Negrelli, MDC director of engineering, has helped lead the district's \$2 billion combined sewer overflow mitigation program.

Left: Metropolitan District crew member Greg Spillman lowers the jetter hose from a Vactor 2100 down a manhole to clean a sewer line.

Different solutions

Because of those issues, the MDC found it could not use a one-size-fits-all approach when undertaking a sewer separation of this scale. Every neighborhood is different, every section of pipe is different and every surprise discovered during excavation is different.

Negrelli also believes it's important to phase projects to avoid working in one particular area for too long and burdening the local customers. Work a little here, then move there, and come back for the next phase after a while.

"You really have to look at the area where you are working to determine if it's going to be a wise decision, or if there is something better you can do in that area," she says. "Every situation has a different solution. You must evaluate all of the ramifications that come along with it. For example, maybe putting in a larger interceptor pipe in a business district is easier than doing a separation."

Regardless, she says upfront communication with the community is critical.

"You're going to have to go into their houses and onto their lawns. You're going to be cutting down their prized tree. You can never have too much communication."

Much of that outreach was done by local community organizations the MDC hired to go out into the neighborhoods to help with distributing flyers and holding public meetings.

"You find a lot of the residents are more comfortable dealing with the people they know, and taking their issue to their community organization. Then the community leaders deal with us directly," says Nick Salemi, communications administrator for the Metropolitan District.

The MDC had a few other tricks up its sleeve to help residents as much as possible. They created traffic alert maps showing closures in real-time and made them accessible on its website. They also established regular "office hours" in neighborhoods where the work was taking place. The maps were so helpful that they remain front and center on the MDC website to let neighbors know how any MDC work will impact their commute. *(continued)*

"Every situation has a different solution. You must evaluate all of the ramifications that come along with it."

Susan Negrelli

Today the field offices are mostly closed, but the Franklin area office is still open and doing community outreach for another big project. Since the MDC was running out of time on the consent order, they halted the separation project, at least temporarily, and started building a storage tunnel. Negrelli says the tunnel project was a oncein-a-career project, but it has been costly.

The MDC also has 16 major interceptors in the combined sewer system receiving flow from trunk sewers, collector sewers and local sewers in Hartford and the surrounding communities. Some of these interceptors date back to the 1860s, with the newest built in 2013. That interceptor, the Holmstead Avenue Interceptor East, was the most significant project the MDC tackled in Phase 1 of its CWP. It is a milelong, 5-foot-diameter interceptor pipe, which won the National 2011 Public Works Project of the Year for the first-time use of curved micro-tunneling technology in the United States.

Eliminating inflow

The MDC's overflow problem is not because of enormous population growth. It's because of an I&I problem — a huge I&I problem. Despite the awards, Negrelli is not exactly a fan of interceptors or, for that matter, tunnels and sewer separation. She explains that member towns don't have adequate storm systems, so while the MDC doesn't have overflow problems during dry weather, high volumes of stormwater enter surrounding sanitary systems during wet-weather events. The fluctuation in flow is drastic. On a dry day, West Hartford sends the MDC about 8 million gallons of wastewater. When the groundwater is high on a wet day, the district will see 69 mgd.

"We need to get the inflow out of the system, then fix our existing pipe networks. We don't want to be building these big pipes," Negrelli says. "The environmentalists and regulators just want the problem solved the quickest way, and the quickest way is to build a tunnel. It's to build a bigger pipe and collect everything because that'll be easier and quicker."

The MDC has a better idea.

MDC CLEAN WATER PROJECT

The Metropolitan District's Clean Water Project was created to address a federal consent decree and a Connecticut DEEP consent order to achieve Federal Clean Water Act goals. Designed to control and reduce the overflow of untreated sewage into local waterways, the CWP includes five major components:

The elimination of inflow from private property and infiltration via cracked or broken pipes and laterals, faulty connections and deteriorated manholes.

The separation of Hartford's combined sewer system.

Construction of two storage tunnels: the South Hartford Conveyance and Storage Tunnel (18 feet in diameter and 4 miles long) and the South Storage Tunnel (handling sewage from West Hartford, Newington, and Hartford).

Installation of a mile-long, 5-foot-diameter interceptor pipe.

Critical upgrades to the MDC's Hartford Treatment Plant.



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Funding the effort

With the Clean Water Project, the MDC committed to spending just over \$2 billion to control combined sewer overflows, and in some cases eliminate them. Currently they are only halfway to the goal but have spent approximately \$1.8 billion. Unfortunately, CSOs are not the only issue that MDC has to address under the consent decree.

To pay for all the repairs and renewals, the MDC gets its funding through State Clean Water Fund grants and loans, and from the issuance and sale of bonds.

Negrelli says that they have been lucky thus far as Connecticut has been very generous with its clean water funds.

Unfortunately for the ratepayers, they must help pay back the debt that the MDC incurs. The district collects its sewer fees through an ad valorem system and a Clean Water Project fee is added to customers' water bills based on water usage. That fee is now higher than property owners' water rate.

"It's getting pretty hard to keep raising that Clean Water Project charge every year. We can't maintain this pace of spending that we're doing right now," Negrelli says.

An integrated plan

For that reason, the MDC went back to DEEP and said they needed to create a 40-year integrated plan that would fix the myriad problems with more holistic solutions.

Corey Patterson carries a section of vacuum tube up to the front of the truck.

"It's getting pretty hard to keep raising that Clean Water Project charge every year."

Susan Negrelli

As part of the integrated plan, they want to fix the existing collections network, separate it in certain areas and limit the construction of large interceptors. The plan was submitted to DEEP in December 2018, and while the district is still awaiting final approval, support has been strong.

"We received eight letters of support, and some towns submitted a proclamation supporting our integrated plan," Negrelli says, noting that she hopes it means something to DEEP.

Negrelli is hoping they will get the green light soon and get to work on the new plan, part of which includes CIPP lining and some smaller, tightly focused sewer separation projects.

"We're asking for 40 years now, but we've given them a phased implementation plan showing what we plan to do for the next five to 10 years." \blacklozenge

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