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September 20

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A ROBOTIC APPROACH TO MAINTENANCE

Yakima invests heavily in sewer rehabilitation
after full system assessment

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Marc Cawley (left)
and Dana Kallevig
City of Yakima Utilities
Yakima, Washington

2024-2025

BUYER'S
GUIDE

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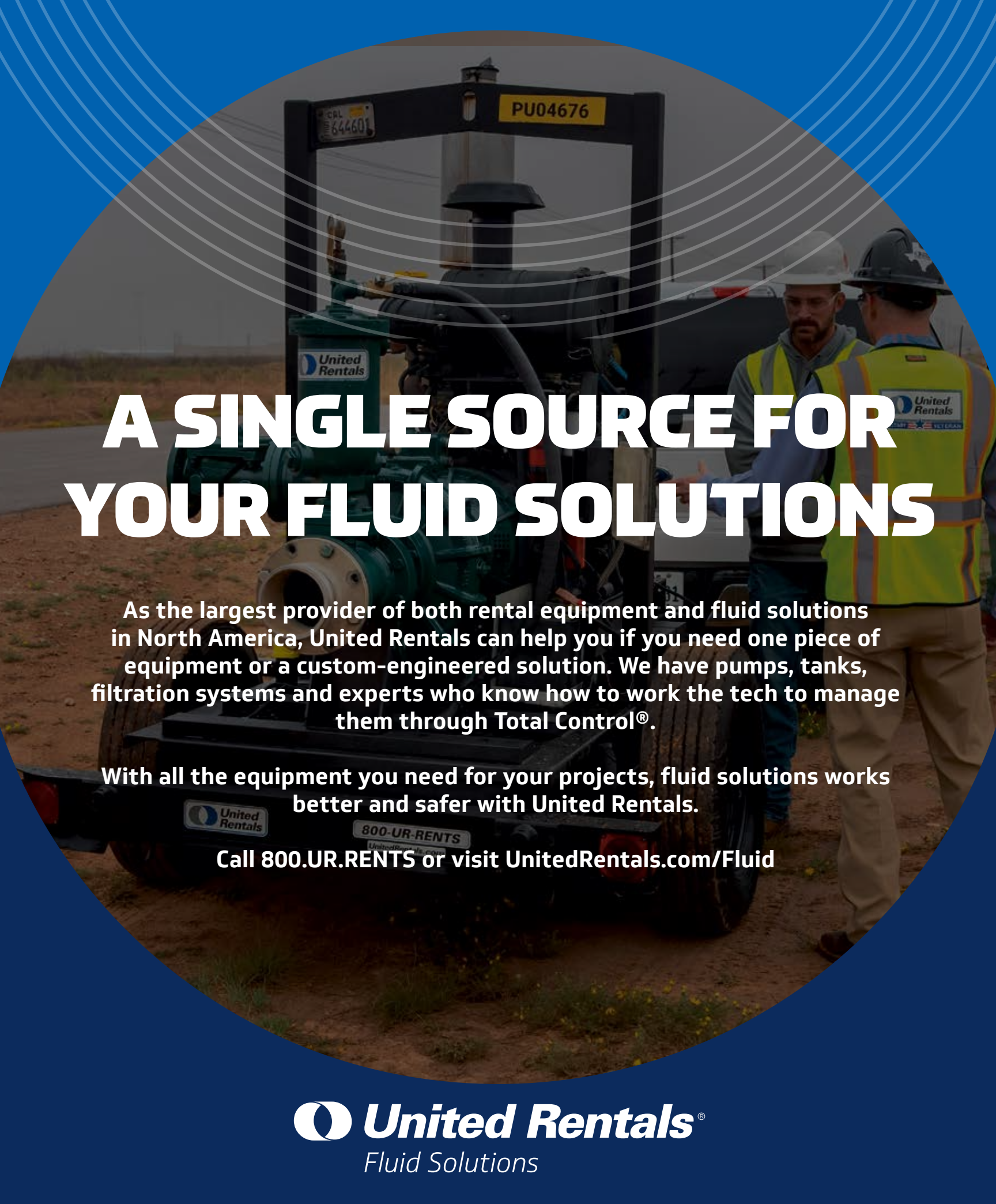
- PVC pipe has a service life in excess of 100 years, reducing the need and use of additional material for replacement and maintenance.
- PVC pipe has the lowest carbon footprint compared to competing materials in gravity and pressure pipe applications.
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ON THE COVER:

City of Yakima Utilities wastewater operations supervisor Marc Cawley (left) and utility project manager Dana Kallevig have helped guide the city's sewer rehabilitation efforts.

PHOTOS COURTESY OF STEPHEN BRASHEAR



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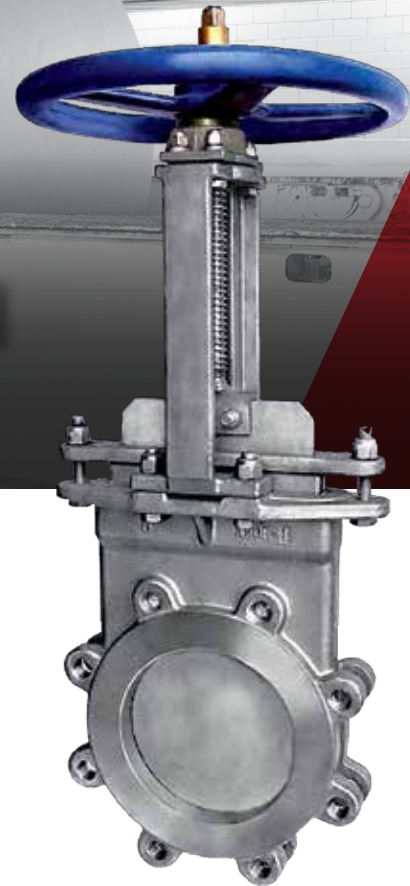
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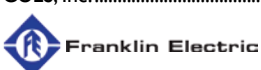



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Luke Laggis

THREATS AT ALL DEPTHS

Water is a resource that needs to be protected at all costs

I spent last Sunday out at a friend's cabin. It's a place I've spent plenty of time going all the way back to high school. We'd reconvene there when we were in college, and especially when we were home in summer, and 25 years later we still get together out there on the occasional summer day.

My friends' high-school-age kids were water-skiing and tubing and running the boat nonstop. It was cool to see a reflection of ourselves at the same age, and to know it's carrying on. So many things have changed, but so many are the same, in the best of ways.

So I was sitting in a chair in the water, having a beer, sun in my face, taking it all in. And all the while weeds kept drifting in around my feet. It's always been a sandy shoreline, with not much more than the occasional lily pad dotting the surface. There's never been a lot of weeds along this shore, but here they were floating in over the sandy shoreline.

Eurasian watermilfoil is a submersed, rooted aquatic plant native to Europe, Asia and northern Africa, according to the Wisconsin Department of Natural Resources. It was first reported in Wisconsin in the 1960s. Eurasian watermilfoil can reproduce via fragmentation, meaning a single stem fragment introduced to a waterbody could take root and establish a new population. It has been verified in less than 10% of waterbodies statewide, but it is present in almost every county in the state. Although Eurasian watermilfoil provides some habitat for fish and invertebrates, it gives lesser quality habitat than the native plants it displaces if it grows too dense and forms a monoculture.

The USDA Forest Service paints a somewhat darker picture, noting that while deceptively delicate and fragile in appearance, Eurasian watermilfoil forms thick mats in shallow areas of a lake, quickly grows and spreads to block sunlight, and kills off native aquatic plants that fish and other underwater species rely on for food and shelter. In North America, the plant threatens the diversity and abundance of native

plants as well as the ecological balance of lakes and ponds, which in turn adversely affects recreational opportunities. If left unchecked, invasive watermilfoil will spread through a lake, or even to other lakes by transmission.

Milfoil has been a problem in this area for quite a while now, and sitting there in the water, I couldn't help but wonder how much this would change the place in the years to come. Would the kids still be here enjoying the water in 30 years? Would it still be a fishing destination? The criticality of water means changes to its quality can have a direct impact on our lives. No, the ability and privilege to enjoy this place isn't a matter of life and death, but water quality is absolutely a life-and-death issue.

We need to be doing more to protect all our water sources, and your roles in those efforts garner my utmost respect.

Enjoy this month's issue. ♦

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800-257-7222; editor@mswmag.com.

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GRAYWATER REUSE

Collaborative University Project

A project led by UC Berkeley architecture professor Maria-Paz Gutierrez — with collaborators from UC Merced and two Texas universities — seeks to significantly reduce residential water consumption by reusing graywater before it is flushed into the sewer system. Read more about it in this online article.

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OVERHEARD ONLINE

“We have entered a new era of concerns, including the adoption of zero-emission vehicles, rising interest rates and labor shortages.”

—VMAC Unveils 2024 State of the Mobile Compressed Air Industry Report
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WATER EDUCATION

Student Video Contest

Solano County, California, hosts an annual student video contest for grades 6-12 to promote water education and conservation. Sponsored by the Solano County Water Agency, the contest encourages students to creatively highlight water conservation efforts and educate their peers.

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CUSTOMER DATA

How to Manage a Security Breach

As a public utility, safeguarding customer data, such as names, addresses and payment information, is crucial. However, cyberattacks targeting this valuable data are common. In this online article, learn how effective communication with the public is essential in the event of a security breach.

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ALLOCATING THE RESOURCES TO SUCCEED

New Britain takes a long-term approach to curtailing I&I and improving system resilience

By Giles Lambertson

Aging infrastructure and delayed maintenance can be problematic. Leadership in the city of New Britain (Connecticut) can testify from long and rather painful experience that neglecting old underground infrastructure is not a good idea.

“Our problem is old pipe,” says New Britain Mayor Erin Stewart, speaking of chronic inflow and infiltration issues in the city’s sewer systems. “And a lot of our problems stem from no one thinking about addressing the issues. The sewer lines are underground and leaders sometimes don’t care about things the people can’t see. Maintaining underground pipe is not a very sexy issue.”

By “old,” we are talking about pipe buried a hundred years ago, some of it nearly 150 years ago. Not all of New Britain’s infrastructure is that old, of course, but utility officials have determined that 80% of the system’s inflow and infiltration problems occur in 20% of the pipe — which includes the old stuff.

This is New England, after all, one of the colonial regions in the U.S. The infrastructure maintenance problem was aggravated when the region began to lose some of its industrial base 50 years ago, thereby losing tax base and funding resources for utility maintenance programs. Many of New Britain’s sister cities in the region share the problem, though it’s also true that some communities in the area struggle less because they are wealthier.

“New Britain is an older town, and not a rich one,” the mayor says of the municipality of 73,000 residents.

Long-term approach

The good news is that the city is fully engaged now in repairing its sanitary and storm sewers. The election of Mayor Stewart 11 years ago was one com-

ponent in what is shaping up as a municipal utility success story.

“This is a long-term project,” says the city’s public works deputy director, Ray Esponda, who heads the city’s utilities division. He is a 23-year employee of the city. “It is an 11-phase program and we’re in phase three. By the time we get to the final phase, we expect to see a major reduction in I&I. If the mayor stays another 10 years, we just might get it done. She’s been the force behind it.”

Actually, attention finally began to be paid to the issue more than 25 years ago when the city contracted an assessment of its 180-mile gravity sewer system. Over two years — beginning in 1996 — sewer flow in the two dozen sub-basins in the city was monitored and groundwater monitoring wells drilled. It was determined that about half of the sub-basins were experiencing excessive inflow and several showed excessive infiltration.

In response, city officials launched a series of rehabilitation projects over the next decade. Though some pipe was dug up and replaced, most was lined with cured-in-place pipe — tens of thousands of feet of pipe ranging from 8 to 18 inches in diameter. The joints in nearly as many linear feet of pipe were tested and grouted.

Most of the pipe is vitrified clay with other types mixed in, including Orangeburg, the bituminized fiber pipe that is the bane of municipal utility departments. “That stuff was never meant to be in the ground for a hundred years,” Esponda says. The fiber pipe usually is fixed by lining it.

Because some of the city’s 3,600 sanitary sewer manholes were allowing water in, watertight covers were installed and manholes were sealed. Some manholes were replaced entirely.





PROFILE:
New Britain, CT Public Works – Utilities Division

SEWER SERVICE AREA:
13 square miles

NUMBER OF SEWER CONNECTIONS:
18,000

MILES OF SEWER MAIN:
180 miles of gravity collection, 0.15 miles of force mains

TREATMENT FACILITY:
Mattabassett District Water Pollution Control Facility (Cromwell, Connecticut)

CAPACITY OF MATTABASSETT PLANT:
Average flow is 35 mgd; peak capacity is 70 mgd

NUMBER OF PUBLIC WORKS EMPLOYEES, UTILITIES DIVISION:
60

WEBSITE:
newbritainct.gov/services/public-works

Mayor Erin Stewart and Deputy Director of Public Works Ray Esponda review the third phase of New Britain FLUSH.

CHANGING PATTERNS POSE PROBLEMS

New Britain, Connecticut, has rainy days and snowy days. Annual totals are about 53 inches of rain and 35 inches of snow. When all that moisture reaches the ground, it has to go somewhere. The rolling terrain of the community sends it to one basin or another in the 13 square miles of the city, where it is collected by the city's storm sewer system and, unfortunately, by its sanitary sewer system.

Two factors are aggravating the situation for the city's utilities division as it tries to handle all this ground and surface water. One is a sewer system that is old and pretty porous. The second is climate change.

"The reality we are facing is that the climate is changing," says Mayor Erin Stewart. She speaks matter-of-factly rather than as an alarmist. The city's Public Works Utilities Division deputy director, Ron Esponda, shares her opinion. "Our biggest concern is climate change. We are having lots of storms."

The U.S. Environmental Protection Agency has echoed the concern. It notes increases in annual precipitation in Connecticut since the 19th century and increases in heavy storm rain volume since the middle of the 20th century.

Since the mayor took office 11 years ago, she has witnessed some of the changes as a public servant. She says recognizing the reality of the change in climate helped her commit to gearing up the utilities division to deal with the problem.

"We face challenges on a monthly basis, massive rainstorms that impact us like they never have before," she says. The impact is on homeowners as well as on the city's storm and sanitary sewer systems, with resulting backups after rain events. "Our system was not built to handle the amount of rain we have been receiving."

Consequently, any reluctance that city leaders and taxpayers may have to expend time and money on solutions to the problem slowly is yielding to the necessity of it. "It is important that we double down on our commitment to right-size our systems based on climate reality."



Ray Esponda, deputy director of public works, utilities division, New Britain, Connecticut.



General foreman Stan Paszczuk (left) and Fabio Rosario install a new catch basin top.

In 2011, the city went after even bigger things — specifically, a 42-by-60-inch rock tunnel. A 36-inch high-density PVC pipe was inserted in the tunnel, fill dirt packed around it and a bulkhead fitted at either end.

All of this sounds like a serious effort to assess and fix a porous pipe and manhole situation, and it was. Yet by 2011, flow monitoring showed that the system continued to be an I&I sieve. As late as 2023, the five-year average flow in the system was 13.5 mgd; expected flow based on water consumption data is 8.5 mgd. Which is to say there was a lot of vagrant groundwater in the sanitary sewer system.

“I was shocked at the amount of storm sewer water going into the sanitary sewer system,” Esponda says. “During a storm event, we can get more than 100 mgd flow.” Consequently, though the previous decade of rehab work was helpful, the city reassessed its approach to the issue and, among other things, decided on a strategy that included better storm sewer management.

“The rainwater going into our sewer pipes overwhelms the wastewater treatment plant,” Esponda says. “We have to address that, also. Managing the sanitary and storm sewers goes hand in hand.” When

the city reorganized its management structure a few years ago, Esponda was placed in charge of the utilities division, which includes sanitary and storm sewer systems and water. It seems a good fit inasmuch as the deputy director originally worked on the water side of utilities.

Reducing I&I

It should be noted that New Britain wastewater is treated in a modern facility in nearby Cromwell,

Connecticut. That district plant serves New Britain and three other communities and has adequate capacity to handle the excessive flow coming out of the city’s sewers.

Even so, the problem came to a head in 2015 when both New Britain and the district treatment plant were put on notice by the Environmental Protection Agency that the clock was ticking on a true I&I fix. “The EPA consent order is really what put the issue in the forefront of our minds,” says Mayor Stewart. “We knew



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Frank Mute and Paul Miller update Ray Esponda (right) on their progress cleaning sewer mains.

SELLING THE NEED TO UPGRADE

When it became evident that the city of New Britain, Connecticut, would have to earnestly commit to upgrading its sewer systems, Mayor Erin Stewart recognized that the program would have to be sold to residents. Her response was “a silly name.”

NB FLUSH is the name, but there is nothing silly about the city’s push to increase the integrity of its sanitary and storm sewer systems. The name is an acronym standing for “New Britain Fresh Line Upgrades for Sanitary Health.” It basically is an awareness-raising program to ensure that residents know about all the underground utility work going on in the city and why it is necessary.

“When we were deciding to really commit wholeheartedly to addressing this issue, I knew that convincing the public that this was a good use of tax dollars was going to be imperative. Selling the idea needed to be a piece of it, using creative ads and marketing.”

NB Flush is, by design, an all-encompassing reference to the utility rehab work, an umbrella reference to all the infiltration and inflow problems associated with failing sanitary sewer pipes as well as to needed upgrades to the city’s storm sewer system and waterline system.

In addition, city leaders created a stormwater fund to help pay for needed improvements. “We call it the clean water fund. It was quite an undertaking to create it. We are still working out the kinks in it. It is a work in progress, but it is another funding mechanism for us.”

Bottom line: New Britain is working hard to fix some infrastructure challenges and city residents are watching them work. “Many residents have experienced the impact in their neighborhoods of 100-year-old sewer infrastructure, especially during seasonal changes this last winter,” says the mayor. “They are paying attention now.”

we had to start addressing it more effectively.”

Officials launched a systematic phased approach to dramatically reduce inflow and infiltration. A 10-year plan was developed with expenditures each year capped at \$2 million. It involved CIPP lining and grouting of sewers and manholes, rehabbing of service laterals and a renewed focus on curbing inflow from private property. This proved to be only a beginning.

“The deal was we would put in \$20 million over 10 years, but we have committed to do \$90 million,” says Esponda. “This is a long-term investment from which the city should be in good shape for the next 50 years or so. It is a multiphase, multipoint attack on the issue.”

The mayor adds: “We strategized and created this 11-phase program and committed to funding it. We know the EPA surely will say at some point, you have to do more.”

Though some \$13 million from the 2021 COVID-era American Rescue Plan will be tapped, money remains a core issue. “Funding is a huge piece of this,” says Mayor Stewart. “It is going to make or break it. We know that to secure adequate funding, we have to remain committed to the plan.”

Envy of Connecticut

The utilities division of the city’s public works department contracts most of its rehab work, according to Esponda, primarily because the type of work involved, which is grouting and pipe lining. Both require specialized equipment. General maintenance and emergency responses, however, are handled by the division’s 60 employees.

“My water staff is the envy of Connecticut,” Esponda says. “We had a major waterline break a while back that we handled in-house. We have undertaken mainline extensions. But sewer lines can be more difficult.”

The problem of water entering the sewer system from private property — sump pumps, roof drains and so on — is handled systematically. Property owners are required to let utility representatives into their homes. Sump pumps are disconnected if that is an issue, and pipes are inspected and sometimes smoke-tested.

“If we find lines are connected to the sanitary sewer and shouldn’t be, we connect them to the proper pipe and pay for the connection — if we can afford it,” says Esponda. “We try to keep it as low-cost as possible.”

No sewer system is ever 100% sealed against I&I, of course, and New Britain’s won’t be either. Esponda’s end goal is realistic. “We are shooting for 20% incursion. If we have 10 mgd of flow and less than 2 mgd is inflow, we will have been successful.”

New Britain has become something of a leader on the I&I battlefield with other communities in the region now calling Esponda, the mayor and others for advice. And what do they advise the callers?

“Find a way to allocate money to the issue,” says Mayor Stewart. “Inflow and infiltration are always going to be an issue, so you have to assure people that you are allocating adequate resources to it.”

The deputy director says he emphasizes long-term planning. “You need to maintain the system. If you have good maintenance, you are on top of

things. If people here had worked on these problems over the last 50 years, our projects now would be a lot less drastic. So, keep an eye on the system and do the work.” ♦



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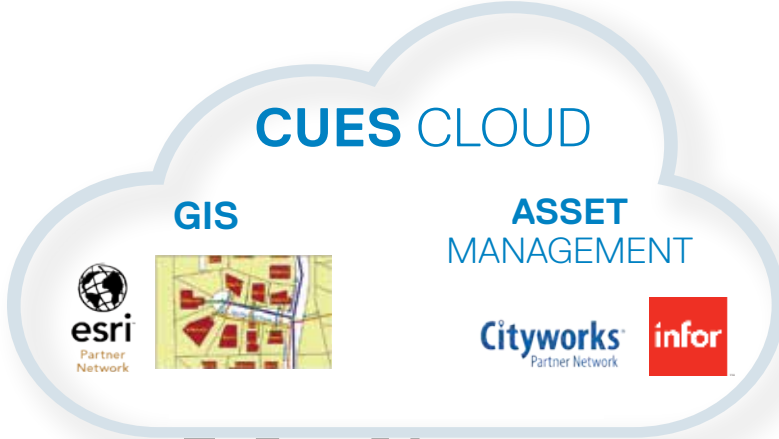
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CUTTING ODOR AND CORROSION

Biocatalysts nearly eliminate sulfuric acid and resulting problems in wastewater lines

By *Giles Lambertson*

Fix one problem and unmask another. That was the sequence by which engineers of the Metropolitan Sewer District of Greater Cincinnati discovered an egregious odor problem in an interceptor line. The solution to the problems surprised district engineers.

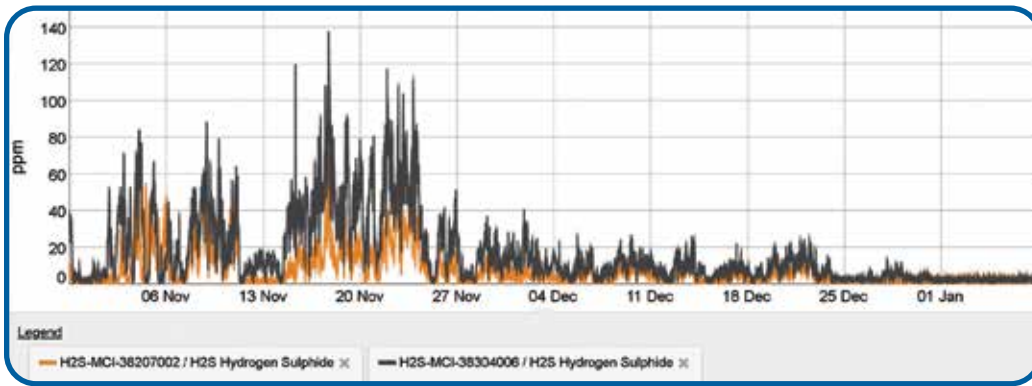
The problems were in a 54-inch reinforced con-

crete pipe. Quite a lot of water infiltrated the line after a hole developed over time. When the hole was located and repaired, the water level fell and the flow of water slowed. That's when something else was detected: the rotten-egg stink of hydrogen sulfide.

"We inadvertently created an odor problem," says

Andy Mackowiak, a business analyst at the district who oversees odor control. It turned out to be a fortuitous discovery.

The problem was in a Mill Creek gravity trunk line that runs for approximately 15 miles toward the Ohio River, including through residential areas. Com-



Over a four-month trial project on a 7-mile segment of the Mill Creek interceptor, usual hydrogen sulfide readings of 100-110 parts per million dropped to 5 ppm.

“We did not expect that dramatic a decline. It showed us the NRP process could be effective.”

Andy Mackowiak

plaints about smells had been recorded for years along the route of the line, especially from a particular manhole located in a driveway. This time, engineers tested upstream from the location and eventually pinpointed concentrations of hydrogen sulfide.

Enter NRP Products, a firm headquartered in Wichita, Kansas. It has manufactured “all-green” odor-control products since 1988, producing non-chemical biocatalytic liquids that are sold under the brand name Bio-Kat.

A four-month trial project on a 7-mile segment of the Mill Creek interceptor was arranged for NRP beginning November 2022. When it wrapped up, Mackowiak and his district peers were surprised by the results: Usual hydrogen sulfide readings of 100-110 parts per million along the line had dropped to 5 ppm.

“We did not expect that dramatic a decline,” he says. “It showed us the NRP process could be effective.” The district bid out a contract for odor control, NRP won it, and the trial project results proved not to be a fluke. The average odor reading along the line today is 2-3 ppm.

None of this surprised David Pipkin, a longtime partner at NRP who is based in Florida. Pipkin calls the Cincinnati Bio-Kat experience “pretty typical.” He cites a client in Hollywood, Florida, some years ago that had hydrogen sulfide readings closer to 1,000 ppm. “We brought it down to 30 ppm. Today, we could get it to below five.”

The secret ingredient in the proprietary process is no secret: Biocatalysts in Bio-Kat accelerate the metabolic breakdown of bacteria by adding nutrients that appeal to microorganisms in sewage. This revs up the metabolism of the bacteria, which feed on the gas-producing substances on the wall of the pipe.

As a bonus, corrosion of the pipe itself by sulfuric acid is slowed by the treatment. “All sewers have a scum layer on the pipe,” Pipkin explains. “That’s where the sulfuric acid is produced by bacteria. The acid corrodes the pipe and also is converted into hydrogen sulfide. We increase the respiratory function of the bacteria and it goes looking for food and that food is the scum layer. Eliminating the scum layer ends the production of acid that produces the odor and corrodes the pipe.”

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BETTER MOUSETRAPS



A typical application of Bio-Kat provides compact and unobstructive dosing.

Also consumed along the way is FOG, or the fats, oil and grease that plague sewer systems and can lead to blockages. The Bio-Kat process greatly reduces FOG buildup, which means that fewer maintenance-budget dollars are spent flushing away fatty grease with a hydro jetter.

The rest of the story is that NRP is a turnkey operation. The company employs staff who install and service the small biocatalytic liquids dispensers at predetermined strategic locations in a system.

In the case of the Mill Creek line, Mackowiak says the “dosing points” are both “upstream and periodic locations downstream to help dissipate odors that join the line there.”

It needs to be noted, however, that the odor-killing biocatalysts are not a permanent solution. Mackowiak discovered that a few months after the end of the trial project on the line. “It stayed the same for a couple of months and then the strength of the odor began to creep back up again. If we stop treatment, it reverts.”

Pipkin likens the process to a person taking a shower to wash away the smell of body oils and perspiration. “Bodies are always excreting waste products. One showering doesn’t stop that.

“Sewer lines are always developing a scum layer that produces sulfuric acid and hydrogen sulfide. We clean away that layer and it takes a while for the layer to re-form, but it eventually does. Removing the layer can’t be permanent unless the treatment is.”

Mackowiak says problem areas in the Cincinnati system will be consistently dosed with Bio-Kat, and not just because of offensive smells. “It helps to prevent corrosion of our pipes. What’s more, the gas is a health and safety issue. Hydrogen sulfide is a pretty dangerous gas and I don’t want it to get out into neighborhoods. It’s dangerous.”

Perhaps the best news — or at least complement-

ing news — is that Bio-Kat treatments also are competitive cost-wise. “The cost is not prohibitive, but it isn’t cheap, either,” Mackowiak says. The price tag for treating the Mill Creek interceptor is about \$300,000 a year, and Cincinnati metro sewer officials have deployed NRP dispensers on another line to combat odor and corrosion there.

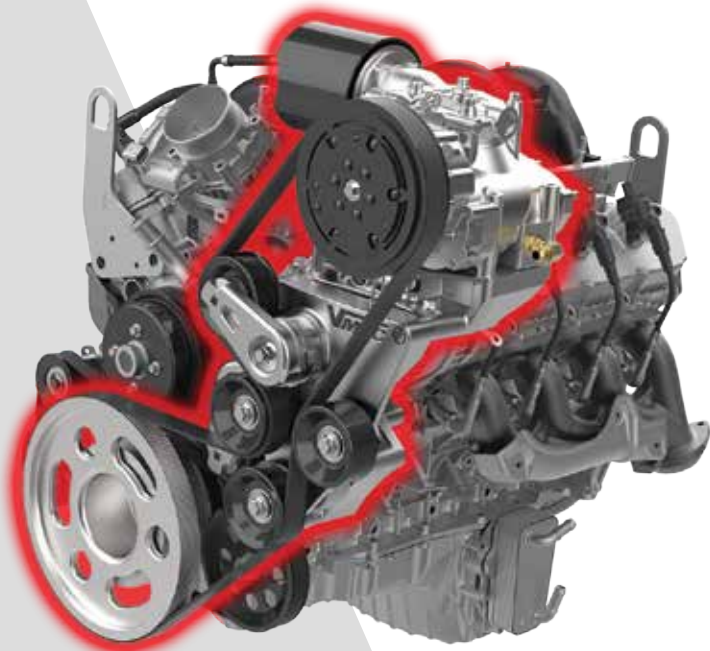
The NRP biocatalyst liquids treatment typically is 25 to 45% less expensive than traditional chemical treatments, according to Pipkin. It is cost-effective in other ways. He cites reduced capital expenditures experienced by a New Orleans parish in repair/replacement of corroded pipe thanks to the treatment, and to the near elimination of sewer line spill-over costs in the Hollywood, Florida, utility because Bio-Kat reduced FOG accretion.

The NRP executive calls such results evidence of the superiority of a 21st century biological process to 20th century chemical processes.

Be that as it may, Mackowiak simply attests that the Bio-Kat dispensers are performing as advertised. “I’ve been happy with the process. The product is doing exactly what the manufacturer said it would do.”

That’s why the district business analyst continues to monitor any patterns of complaints about odors in the Cincinnati system. He doesn’t expect the entire system to need biocatalyst treatment, but any problem areas that show up can expect a dose. ♦

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A ROBOTIC APPROACH TO MAINTENANCE

Yakima invests heavily in sewer rehabilitation after full system assessment

By **Jim Force**

If there's a lesson to be learned from the Yakima, Washington, sewer rehabilitation project, it's that planning and communication are just as critical to success as vacuum trucks and CCTV equipment.

"Get started early," says Marc Cawley, wastewater and stormwater operations superintendent for the city. "It's important to build trust with your management and leadership team."

Yakima Utilities had been moving along slowly rehabilitating its most aged 175 miles of sanitary sewers, spending about \$500,000 a year focusing on what Cawley and Dana Kallevig, the city's utility project manager, call "low-hanging fruit."

Today, they have completed a project of assessing the condition of all their wastewater collection pipelines (approximately 360 miles of pipelines) using multisensor equipment, CCTV equipment and robotic cameras contracted through RedZone Robotics, and are saving significant dollars by using CIPP to replace aging or damaged pipes wherever possible.

The two reported the results of the project at the 2024 No-Dig Show in April in Providence, Rhode Island.

Background

The city could not have achieved this level of success without meetings and discussions with utility management and city leaders back in 2012. "We shared photographs with them showing what maintenance work was needed," says Cawley. "They were willing to invest, and we've been able to produce results that will make a difference in our community." He says the budget for pipeline rehabilitation has gone from \$500,000 a year to \$1.5 million annually and will continue to grow.

"We've made progress but there's still a way to go," adds Kallevig. "We've been able to identify problem areas before any catastrophic failures that might impact our community's residential or business areas."

Yakima system

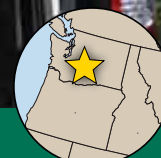
The Yakima Wastewater Department operates a regional activated sludge wastewater treatment plant, serving about 100,000 city residents plus the neighboring communities of Union Gap, Terrace Heights and Moxee. Average daily flow is 10 mgd.

The department's collections team is responsible

"We've extended the life of our rehabilitated pipes by 50-plus years."

Marc Cawley





PROFILE:
City of Yakima (Washington)
Utilities, stormwater and
wastewater departments

EMPLOYEES:
15

INFRASTRUCTURE:
360 miles of collection lines
ranging in size from 6 to 60
inches in diameter, 10 lift
stations and approximately
7,300 manholes.

PIPE REHAB BUDGET:
\$1.5 million annually

CUSTOMERS:
100,000 city residents plus
the neighboring communi-
ties of Union Gap, Terrace
Heights and Moxee.

WEBSITE:
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RedZone Robotics camera technician
Julian Delapaz prepares to assess a
wastewater line for City of Yakima
Utilities in Yakima, Washington.

PHOTO BY STEPHEN BRASHEAR



City of Yakima Utilities wastewater operations supervisor Marc Cawley (left) and utility project manager Dana Kallevig at the city's wastewater treatment plant.

“It’s important to build trust with your management and leadership team.”

Marc Cawley

ROBOTS DID THE JOB

The robotic inspection technology used by City of Yakima (Washington) Utilities provided the city with a number of benefits as it conducted its systemwide pipeline inspection and rehabilitation project.

Provided by RedZone Robotics, Inc., autonomous “squads” of robots were able to assess the entire Yakima system in just a few months, differentiating specific areas in need of cleaning from those that didn’t require it.

In addition, the robotic units are battery-powered, reducing carbon footprint, and operators simply drop them into a manhole and close the lid. No large trucks need to occupy the site, engines idling, and there is less traffic disruption. Furthermore, coding is done offsite at the RedZone offices, another factor in keeping the site clear of workers and equipment.

“The result is lower costs, and higher production rates,” says Veronica Alvarez, RedZone manager for the U.S. West.

RedZone developed its robotic technology in the late 1980s and early 1990s. The robots use multi sensor and CCTV technology; operating autonomously, they are able to inspect hard-to-reach locations and small pipes, and function in aggressive environments. Four robots comprise a squad, which moves from manhole to manhole with minimal operator attention.

The imagery collected is clear and results are delivered in Integrity, a new cloud-based sewer inspection software platform developed by RedZone.

“Kudos to the Yakima team,” says Alvarez. “They have a good maintenance program and we were able to produce good deliverables for them.”

for the Yakima portion of the sanitary sewer collection system only — approximately 360 miles of pipe, ranging in size from 6 to 60 inches in diameter along with 10 lift stations and approximately 7,300 manholes. Portions of the system — including sewers serving the city’s central business district — are more than 100 years old. Fully half of the 360 miles of pipes consist of vitrified clay or unreinforced concrete. Sanitary and storm sewer systems are separated.

Cawley says the major issues faced by the cleaning crews are roots, followed by grease and the accumulation of rocks, sediment and other debris. In some residential neighborhoods, access to sewer manholes are difficult, sewers are under backyards and present issues like infiltration and inflow, root intrusion, and therefore require more time and coordination to maintain properly.

The collections team consists of 15 professionals.

Cawley manages the department. He started at ground zero with the city’s wastewater team 20 years ago as a temporary employee. Kallevig has been

with the city for 15 years managing projects for the wastewater and engineering divisions. Before that he served in a similar capacity for the state department of transportation. Robert Brown supervises the collections team. He started with the department 26 years ago as a collections specialist. Scott Schafer is director of public works; Mike Price is wastewater/stormwater manager.

The department has one CCTV unit (TrakSTAR RST); four series 2100 Vector trucks, two of them devoted to stormwater cleaning; and one Sewer Equipment 900 Eco.

The city usually bids out any pipe replacement work to outside contractors.

The old days

In the old days, the city was using its CCTV equipment to assess and identify that low-hanging fruit and among other things, inspect the construction of new pipeline installations.

“Staff was telling us what areas were in need of



Yakima Utilities wastewater maintenance specialist Rich (left) and water maintenance specialist Shane Jones flush a sewer line.

repair,” he says. “All credit to our operators. They were identifying issues. We’d make a list. But then nothing would happen.”

Any progress they did make was painfully slow. Cawley says the sewer crew worked on the smaller-diameter lines, patch repairing areas of immediate need. “At that rate, we were not reaching our desired outcomes of proactively rehabilitating the aged system,” he says.

The trust-building with management in 2012 quickened the pace. “We were able to accelerate the program,” Cawley says. Using ICOM software (now known as Integrity), the collections team was able to finalize the cleaning schedule for all pipes 27 inches in diameter and smaller.

An additional CCTV system was acquired to enable a systematic evaluation of pipeline conditions. Working with its consultant, the city developed a wastewater collections system master plan.

“We started slow, built trust and expanded our budget gradually, to the point that today pipeline rehabilitation is a line item in our budget,” Kallevig points out.

“Not only were we taking care of the system and expanding testing, we were setting priorities. It was not only the condition of the pipe, but also the consequences of failure — its potential impact on the community.”

The program received a big boost in the summer of 2023, when the city contracted with RedZone Robotics to provide a systemwide condition assessment using robotic technology. The autonomous cameras can be dropped into a manhole, and can travel through the smaller pipes in the system, even some pipes that larger assessment devices would not be able to get through due to the condition of the pipeline. They return to the entry manhole, are removed, and the photo imagery is sent to RedZone headquarters for review before the data is transmitted back to the Yakima collections team.

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Members of the Yakima Utilities staff at the utility's maintenance facility.

Using the RedZone robotics, Yakima had completed assessment of 300-plus miles of sewers by last November. Crews were able to examine 12,000 feet per day, with each crew directing four robots. CCTV was used for the larger lines up to 21 inches, and for pipes 21 inch up to 60 inches in diameter, the team pulled a multisensor configuration through each section.

City crews supported the effort, cleaning pipes that needed it, operating lift stations, coordinating access issues and helping to inform the public.

By this past summer, all the work had been completed.

Cawley says the robots could assess and photograph a complete route of sewers in a single day. Efficiency was greatly improved. "In 85% of the cases, they indicated the line didn't need to be cleaned before the assessment could be made," he says.

"It gave us an accurate assessment of the entire system," says Cawley. "Not just a selective assessment. We're now able to clean only the pipes that need it. That saves taxpayer resources that can be better used rehabilitating deficient pipelines."

He and Kallevig agree that the robotics pro-

vided additional benefits — they are battery-operated, use less fuel and require no generator on site. The system is less obtrusive, as well. The robots can be simply dropped into a manhole, the lid replaced, and vehicle traffic allowed to continue normally. That was an important factor in the downtown business areas.

Replacement

Yakima uses a number of methods to replace pipes that are prone to failure. Kallevig says the city has replaced approximately 10 miles of pipe using the CIPP technology (Insituform and Iron Horse). About 2.5 miles of old pipe have been replaced using the open cut method. The city has sliplined another 1.25 miles, and has used pipe bursting for 3,000 linear feet.

By far, CIPP has proven to be the most effective. Kallevig reports an average cost of \$87 per foot for CIPP, compared to \$557 a foot for open cut and \$393 a foot for pipe bursting.

"There are situations where open cut is desirable, but we consider it a last resort," says Cawley.

Kallevig says the condition assessment has

enabled Yakima to update priorities and establish future budgets.

"We've extended the life of our rehabilitated pipes by 50-plus years, per manufacturers' specifications. And we've achieved an excellent payback rate for our ratepayers by reducing maintenance costs and improving our efficiency."

Cawley adds, "With the efforts and resources put forth by the wastewater and city leadership teams, our preventive maintenance program will continue to help prevent future catastrophic failures. Currently, the collections staff through dedication and workflow assessments have limited sanitary sewer overflows to only one in 2024. That's a remarkable accomplishment and wastewater management is extremely grateful for all the great work contributed day in and day by all the wonderful employees in wastewater.

"Together, we're improving our wastewater system for generations to come." ♦

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BUILDING A CULTURE OF CONSERVATION

Santa Fe looks to youth education and public involvement to encourage water-saving behaviors

By Steve Lund

Santa Fe had substantial success cutting per-capita water consumption. Now the New Mexico capital city is focusing on a long-term conservation strategy built on youth education and public involvement in decision-making.

“A lot of research now shows that it’s the money

and time we put in with our younger kids that will save the most water in a lifetime,” says Christine Chavez, water conservation manager. “If you try to teach an adult something different, first of all you have to break a habit that they’ve established for 30 to 40 years.

“Then they have to take on a new behavior. And

for the rest of their lifetime, they’re going to save X amount of water. But if you change a 7-year-old’s behavior, we have so many more years of savings to consider. So where do we get the bigger bang for the buck, long term? We’re really looking at our youth to help us get there.”

Hitting a plateau

Chavez received the 2023 Water Star Award from the Alliance for Water Efficiency for making Santa Fe's conservation programs a model for the Southwest. She notes that the city is fortunate to have multiple sources — Colorado River water, two well fields and two reservoirs — and a reuse project in development.

“And then we also consider conservation to be a source of water,” says Chavez. “The more water we conserve, the more that water can be used to support

other things, like new residents who move here, or new industries and commercial uses.”

Santa Fe has been working on conservation for a long time. From 1995 to 2020, consumption has declined even though the population has grown. Per capita consumption in that period dropped 45%, from 168 gpd to 93 gpd.

But Chavez, who joined Santa Fe in 2017, finds it harder to make gains these days. The city has used incentives like bill credits for water-saving appli-



“The more water we conserve, the more that water can be used to support other things.”

Christine Chavez


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Volunteer Craig O'Hare portrays the Water Wizard and Patricio Pacheco, water resources and conservation specialist, talks to students at the Water Fiesta, an annual event for fourth graders.

ances; technical tools like the EyeOnWater web portal and smartphone app, which give customers data on water use and alerts them to possible leaks; and promotion of irrigation best practices for landscapes and gardens.

“Before we could just see water use declining,” she says. “Now we’re really getting down to demand hardening. A lot of people are already doing those simple things. How do we push that needle even further? And our managers now are asking: How much money are we spending per gallon of water saved?”

Creating partnerships

In previous positions, Chavez felt like a lone warrior for conservation, but since she came to Santa Fe she has focused on developing partners to help spread the message.

“I feel like the most essential part of this work is to form partnerships,” she says. “I can’t go out to all the schools. But if I partner with a group that’s already providing environmental education in schools, then I’m helping them do their job, and they’re tailoring their message to get the key points of our program across.”

She has built partnerships with educators, with Santa Fe Community College, and with the chamber of commerce. “It never works for me to go to a business and say, ‘We’d like to audit your water use

and give some recommendations.’ But if a chamber of commerce approaches that business and touts the benefits of saving water and saving money, that really helps us.”

Chavez has worked with the community college on a program to train water use auditors. “This is a multilayered program,” she says. “We’re building a workforce through the community college. We’ve built our own certification program. We have trained professionals doing audits of businesses on our behalf. And that’s where the Chamber comes in, too. They’re helping us promote this program, and they schedule the audits.”

Public involvement

The most important partnership is with the public. “We have a five-year scorecard,” Chavez says, “And then we create an annual scorecard based off that with the help of a citizen-based Water Conservation Committee. They help us write that, and then we report our progress to the public on our website every six months. Then, with public input, we develop the new scorecard for the upcoming year.”

Chavez observes based on her work with the committee that the public is very concerned about water quality and water scarcity. “One big reason for our success is that we continue to involve the public in our efforts and in the way we communicate what we’ve

done, what we’re going to do, and what they would like to see us do.”

Santa Fe still gets a significant number of applications for installing water-saving appliances, but Chavez is also looking for high-impact projects. “We’re piloting a program now to go into low-income apartment complexes and doing a complete retrofit of all their toilets, showerheads and aerators,” Chavez says.

Projects like that help the residents by reducing their utility bills while conserving a lot of water: “In one of those projects, we’re replacing 300 toilets as opposed to the single application to replace just one.”

Over the years, Santa Fe has developed a culture of water conservation. Chavez tries to foster that with continuous public involvement and education. “As far as education we’re trying to establish the value of water, so that kids and teenagers and even their parents and families understand it is a limited resource,” she says.

The partnerships also help: “We’ve got great public support. I can turn to any of my partners now and they’re marketing our programs on their websites and to their email lists. It’s just like layers and layers and layers of communication.” ♦



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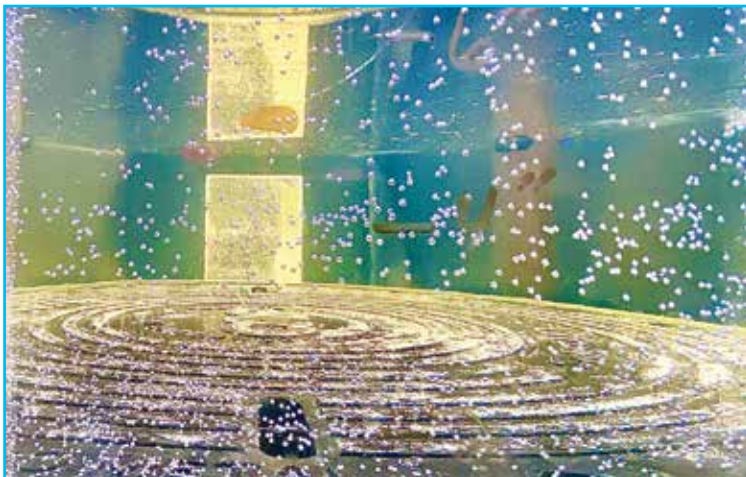


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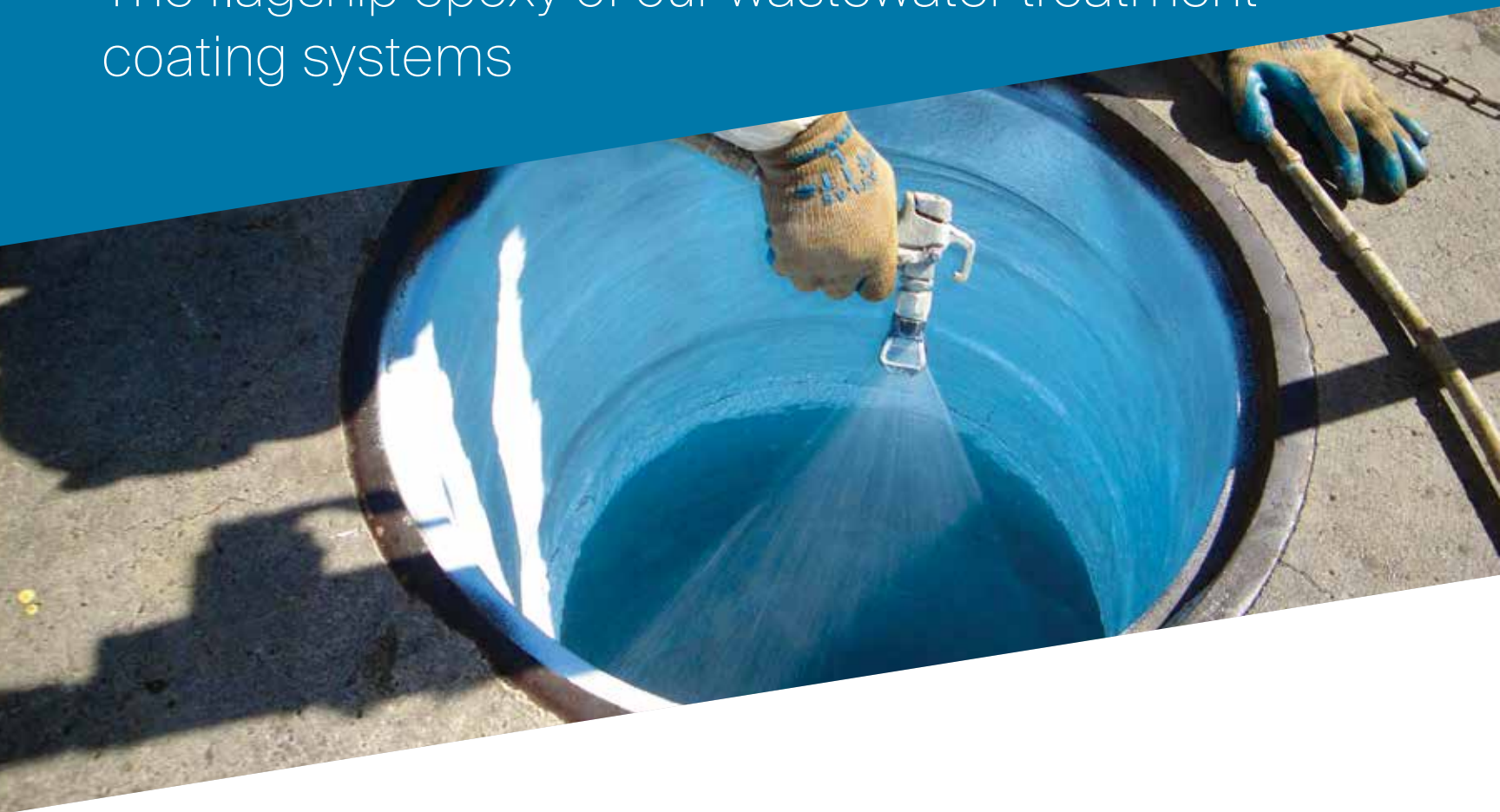
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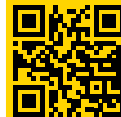
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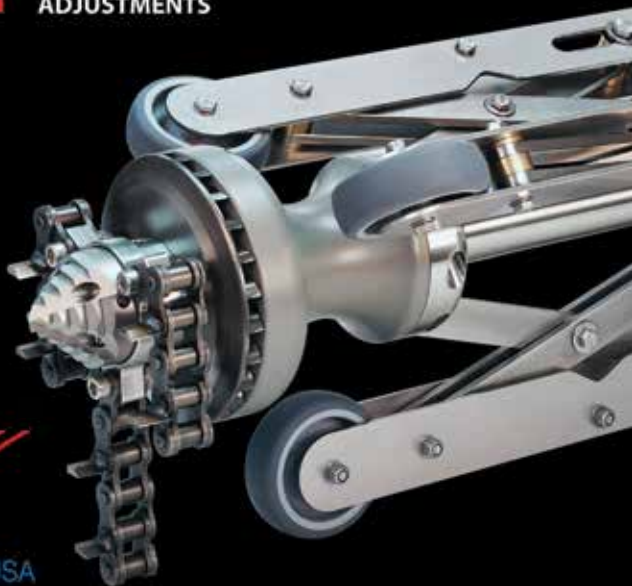
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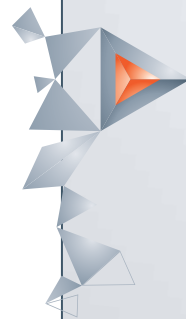
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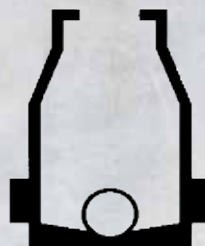
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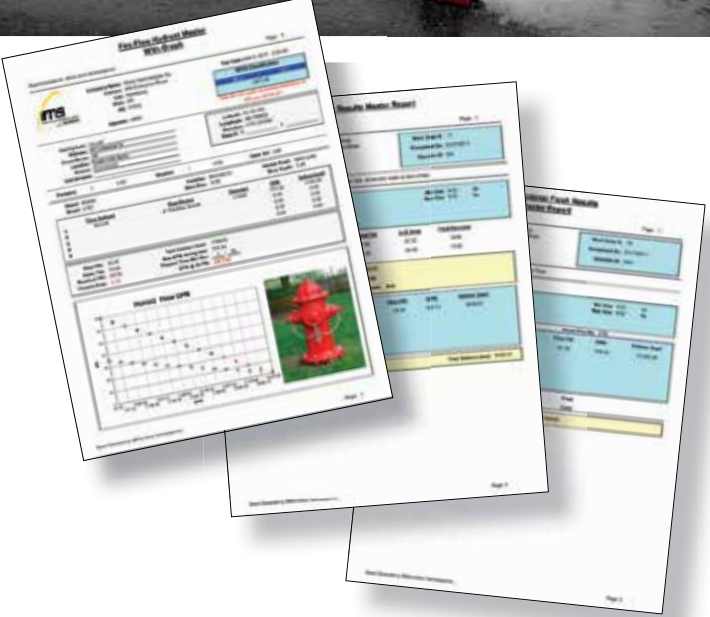
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THE SAFETY RISKS OF HEAVY EQUIPMENT

Injury and death can be prevented with careful adherence to safety protocols

By *Ronnie Freeman*



The average weight of an excavator is around 35,000 pounds, the average weight of a backhoe is around 25,000 pounds, the average weight of a front-end loader is also around 25,000 pounds and a track loader can weigh up to 10,000 pounds.

Heavy is the appropriate word for this type of equipment. In fact, larger versions of these types of equipment can weigh up to and even over 100,000 pounds. So it goes without saying that safety is vital to the daily operation and work around heavy equipment. But I'm going to say it anyway, if employees are not taking safety seriously, they are putting themselves and others in grave danger.

Throughout the years, there have been too many stories in the news of employees being seriously injured or killed working on or around heavy equipment. The common denominator to these incidents is unsafe acts — human error because an employee decides to take a shortcut or is distracted or perhaps overconfident and took chances. Typical incidents that occur are rollovers, employees being crushed by the equipment, falling equipment or loads, or employees being in blind spots.

Some of the common factors in most incidents are improper loading of the equipment, improper lifting, improper positioning for the task, using the equipment for purposes which it wasn't intended to be used, employees not being properly trained to operate the equipment, operating at improper speeds for the conditions, removing safety devices and improperly connecting attachments. The word improper is used a lot in this list which means that employees are not following safe work practices when operating heavy equipment.

There are several factors that can contribute to operators not being fully aware of the hazards that they are dealing with when it comes to operating heavy equipment. Inclement weather conditions, fatigue, the operator's emotional state, the operator's physical health and other employees in the area causing distractions. Speaking of distractions, cellphones need to be turned off while operating heavy equip-




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ment. As difficult as it may be, the operator must stay focused and put all the distractions aside to properly — and safely — operate the equipment.

The operator and the employees working in the work area should have a plan and work together to make safe operations a must at all job sites. Some questions to answer when planning for a safe work site include:

- What are the conditions of the work site, and how can we make them safe?
- Will there be other work going on around our work site?
- Will other contractors be there onsite?
- What do their work practices look like?
- What tasks will I be using this equipment for?
- Will there be a need for other heavy equipment or large trucks while operating the equipment? Are utilities accurately marked?
- What's the plan if I hit an underground utility?
- If I am going to be lifting materials, do I have the proper lifting equipment?
- Do I have what I need for properly transporting the equipment to be used?
- Do I have a spotter for my blind spots and backing?

These questions and others may sound simple, but they can be easily forgotten or discarded when the rubber hits the road and you're working to get a job done. But no job is done unless safety is a priority. ♦



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raising the bar UNDERGROUND



New Technology Slated for New Orleans 2024

By Craig Mandli

The 97th annual Technical Exhibition and Conference offers international water and wastewater professionals exposure to the newest products, along with water-quality education and training. This year's event, from Oct. 7 to 9 in

New Orleans, promises to show off some of the finest new products on the market for municipal water, industrial water and wastewater professionals. Below is a preview of some of the newest products highlighted at this year's show.

AERZEN Delta Hybrid Direct Drive Screw Blower

The AERZEN Delta Hybrid Direct Drive Screw Blower

offers an efficient newly designed stage with a 3+4 rotors profile, extended turndown ratio of up to 1:5, and a new drive concept for low-pressure applications. A reduced footprint accommodates side-by-side installation. See how easy it is to generate low-pressure compressed air with substantial cost savings. It offers up to 37% higher energy efficiency compared to previous blowers, along with maximum noise reduction with customized silencer technologies.

610-380-0244; www.aerzen.com; Booth 6447



Aqua-Aerobic Systems AquaPRS PFAS Removal System

The AquaPRS PFAS Removal System from Aqua-Aerobic Systems utilizes sorbent suspension to adsorb PFAS and a separator to extract clean water from the suspension. The turbulent adsorbent slurry prevents biofouling and controls solids and mineral buildup. Additionally, the adsorbent material is specially engineered to adsorb much more PFAS than can be adsorbed by the same amount of other adsorbents or ion-exchange resins, resulting in significantly fewer life cycle costs. The process is completely automated, including replacement of the adsorbent, and allows parameter adjustments in response to varying influent concentrations of PFAS.

815-654-2501; www.aqua-aerobic.com; Booth 2641



Aries Voyager HD Mainline Inspection System

The Voyager HD Mainline Inspection System from Aries is a high definition video system for inspecting relined mainlines



6 to 48 inches. It includes a powerful transporter, a full HD 1080p WiperCam camera, and 1,200-foot cable reel — controlled by CANbus technology for instant crawler and camera response. Components are operated by an ergonomically advanced dual joystick controller and reel-mounted pendant. The tractor is equipped with a rear-viewing HD camera and an integral motorized lift to center the camera in a range of pipe sizes. The pan-and-tilt video camera with 120x zoom captures every pipe detail. Built-in lens wiper technology maximizes time in the pipe.

800-234-7205; www.ariesindustries.com; Booth 641

Asahi/America Series 19 S400

Asahi/America has expanded its Series 19 electric actuation line to include a larger-sized actuator, the S400, capable of operating on the company's family of 8- and 10-inch Type-57 butterfly valves. It is part of the SAV Smart Pack electric actuator product line and is available as an on/off, failsafe, modulating, or modulating failsafe unit. The actuators have an output torque range up to 3,540 inch-pounds. Standard features include a heater, one set of dry contacts for PLC confirmation and one for alarm reporting, an OLED screen with push-buttons and local controls.

800-343-3618; www.asahi-america.com; Booth 2653



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local section, a print subscription to Opflow — the water community's primary network for operator-level workers, member-exclusive pricing on trainings and publications to help earn and maintain an operator license, additional member discounts on all other AWWA offerings and a professional network.

800-926-7337; www.awwa.org; Booth 1045

BDP Industries DSP Screw Press

The DSP Screw Press from BDP Industries is a heavy-duty option for those looking for dewatering performance in a completely enclosed unit with low energy and water consumption, along with reduced operation and maintenance costs. The pivoting basket design allows for increased access for maintenance. Other improvements include the vertical thickener for prethickening, processing flow rates of up to 150 gpm, as well as the ability for a small-scale package system capable of 5 to 10 gpm.

518-695-6851; www.bdpindustries.com; Booth 1743



Blue-White Industries FLEXFLO M4

The low-shearing pumping action of the FLEXFLO M4 peristaltic metering pump from Blue-White Industries allows it to dose long-chain polymers gently and precisely without damage to the chemical. It will also meter off-gassing chemicals such as peracetic acid and sodium hypochlorite without experiencing vapor lock or loss of prime. Advanced features include a responsive 5-inch LCD with clearly recognizable icons that will respond even when the operator is wearing work gloves. Legacy communications include 4-20mA, and advanced communication protocols include Profibus, Modbus TCP and Ethernet IP. M4 firmware is field-upgradeable.

714-893-8529; www.blue-white.com; Booth 3753



Crane Pumps and Systems Barnes Chopper Pumps

Barnes Chopper Pumps from **Crane Pumps and Systems** are designed to meet the rigorous demands of wastewater applications, catering specifically to collection systems, raw sewage and other scenarios with substantial solid content. These pumps excel in solid size reduction, offering heightened reliability, ease of servicing, and overall low life cycle costs. The versatility of choosing between an oil-filled or air-filled motor enhances their adaptability, allowing users to tailor the pump to the requirements of their application. The chopping technology and hydraulic performance in both motor options slice through even the most challenging solids in the waste stream. **937-773-2442; www.cranepumps.com; Booth 3645**



CUES OZ4-HD

The **CUES OZ4-HD** is a 1080p high-definition pan-and-tilt mainline camera for sanitary and storm sewer inspections. Designed to meet the highest industry standards, it offers video with a level of detail that can detect and address potential pipeline issues with superior accuracy. Additionally, it is designed specifically to be backward compatible, meaning customers currently running CUES equipment are now able to upgrade to HD for a minimal investment. GraniteNet Software offers robust support for HD video, ensuring seamless integration and optimal performance when using the camera. **800-327-7791; www.cuesinc.com; Booth 519**



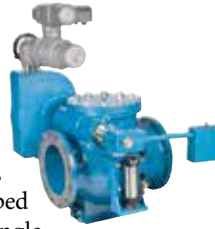
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Using more than three decades of experience in adsorptive technologies, **De Nora** has taken the lessons learned from treating arsenic and other organic contaminants and applied that expertise for the removal of PFAS. Ensuring compliance, **SORB Contaminant Removal Systems** are pre-designed and pre-configured to make application design simple, while maximizing uptime, cost efficiency and ease of operation. Systems are optimized for treating PFAS, whether using ion exchange, GAC or both, and have piloting capabilities to help determine the optimal technology based on the specific water quality matrix. **215-997-4000; www.denora.com; Booth 2616**



DeZURIK APCO SmartCHECK

APCO SmartCHECK pump control valves from **DeZURIK** are for raw sewage, wastewater, raw water, clean water or any fluid pumped through a pipeline. It is a single valve that combines the functionality of a full-featured electric motor-operated pump control valve with the best features of APCO's premium CVS-6000 swing check valve. It has been engineered to control pressure surges during normal pump start-ups and shutdowns, and to close positively upon power failure, without the need for hydraulic power units, accumulators and maintenance-intensive hydraulic controls. The torque unit allows normal function, but will automatically close upon power failure, preventing backflow. **320-259-2000; www.dezurik.com; Booth 917**



Emerald Coast WAVE Vacuum Sampler

The **WAVE Vacuum Sampler** from **Emerald Coast** represents a significant leap forward in wastewater sampling technology. Its sampling chamber delivers a high rate of accuracy. Achieving $\pm 3\%$ accuracy on the first draw and less than 1% repeatability thereafter, it ensures consistent and reliable sampling results. This high level of precision eliminates the need for constant calibration, saving time and reducing operational costs. **850-469-1142; www.emeraldcoastmfg.com; Booth 2061**



Fournier Rotary Press

Experience seamless, fully automated dewatering operations with minimal operator involvement. The **Fournier Rotary Press** optimizes polymer usage through an external mixing process, allowing operators to easily verify floc quality. With extremely low power and washwater usage, it ensures both efficiency and cost-effectiveness. The design features robust construction, few mechanical parts and slow rotation speed, resulting in the lowest maintenance cost. An automated 5-minute daily self-cleaning cycle further enhances reliability, making it a sustainable choice for wastewater management. **800-463-6328; www.fournierindustries.com; Booth 1219**



Halliday Products Series F Flushmount Floodtight Covers

Series F Flushmount Floodtight Covers from **Halliday Products** are made from highly durable aluminum and stainless steel, featuring EDPM compression gaskets, spring assists and stainless steel camlocks. They are structurally designed to support a 25-foot column of water. **800-298-1027; www.hallidayproducts.com; Booth 7329**



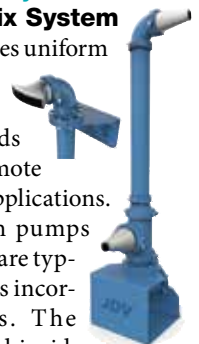
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Highly efficient and durable geared **centrifugal blowers** from **Inovair** deliver a low total ownership cost. Thanks to industry-standard components, their proven design offers simplicity and 99.6% uptime. They offer energy savings as high as 45% relative to alternative options, without electrical complexity and durability issues. Designed to be compact and for outdoor installation, implementing the blowers avoids expensive construction costs. **913-469-7244; www.inovair.com; Booth 4075**



JDV Equipment Nozzle Mix System

The dual-zone **Nozzle Mix System** from **JDV Equipment** provides uniform mixing patterns that produce even distribution and a stable environment. It optimizes solids suspension and contact to promote efficiency in a wide range of applications. The system is designed with pumps installed outside the tanks and are typically chopper pumps or pumps incorporating in-line grinders. The high-velocity nozzles mounted inside the tank completely mix the tank contents. Applications include anaerobic digestion, biosolids storage, blending tanks, excess flow tanks, septage or leachate, anoxic zones, CSO handling, aerobic digestion, secondary treatment and biosolids holding ponds. **973-366-6556; www.jdvequipment.com; Booth 2201**



Keller America LevelRat

The **LevelRat** nonfouling level transmitter from **Keller America** is built to provide reliable, low-maintenance service in wastewater level measurement applications. It offers 0.5% FS TEB accuracy, multiple output signal options (analog and digital), and models



equipped with a 4-20 mA analog output include UL/cUL approvals for use in hazardous locations as well as lightning protection at no additional cost. **877-253-5537; www.kelleramerica.com; Booth 935**

KROHNE OPTWAVE 1500 Series

The **OPTWAVE 1500 Series** from **KROHNE** is the latest member of the OPTWAVE 80 GHz radar product family. The affordable, yet high-performance product is suitable for level or open channel flow applications throughout water and wastewater processing facilities. **800-356-9464; www.us.krohne.com; Booth 6323**



Lakeside Equipment Screw Pumps

Lakeside Equipment Screw Pumps efficiently lift large amounts of water at a low static head. Variable pumping capacity automatically adjusts the rate and power, eliminating the need for costly electrical controls. The reliable screw pumps (open and closed) fit a variety of applications including raw and industrial wastewater, as well as stormwater pumping, capable of draining waterlogged land by moving large quantities of water from lower to higher areas. And since they require little attention, they are suitable for remote plants. They are BABA-compliant and make ideal drop-in replacements for less reliable designs. **630-837-5640; www.lakeside-equipment.com; Booth 1829**



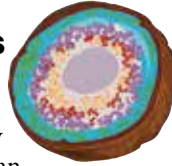
OZ Lifting Products Davit Cranes

Streamline water treatment operation with **OZ Lifting Products'** versatile **davit cranes** featuring steel, aluminum, and composite materials. Options include the Alumi-Lite, CompOZite and CompOZite Elite with features like aerospace-grade aluminum and carbon fiber, boasting high strength-to-weight ratios. The Tele-Pro's telescopic boom and XR Series cranes offer exceptional reach and maneuverability. Plus, save money with its multibase system. Buy one crane and use it with multiple strategically placed bases around a facility, reducing overall equipment costs. **800-749-1064; www.ozliftingproducts.com; Booth 8229**



Parkson Granite AGS

Parkson's Granite AGS process is designed to improve the performance of activated sludge systems. It has the ability to form granular sludge rather than typical floc-forming sludge. The advantages of aerobic granular sludge are excellent settleability and robustness of the biological colony. The granules settleability is more than 5X faster than a conventional activated sludge floc from the dense nature of the colony. Denser, better-settling sludge allows plants to be designed with smaller treatment basins, reducing capital costs, and providing greater sustainability given more efficient operation. **888-727-5766; www.parkson.com; Booth 4001**



Polydyne polymers **SNF** | **POLYDYNE INC.**

Polydyne offers a line of water-soluble **polymers** for municipal water and wastewater treatment applications. The CLARIFLOC line provides high-quality flocculant and coagulant polymers, essential for improving water clarity and treatment efficiency. FLOSPERSE products are designed for effective scale prevention and treatment, ensuring smooth operation and reduced maintenance costs. The FLOSURGE line of drag-reduction polymers enhances flow across various applications, including cake solids hauling, pumping, municipal irrigation, and stormwater management. The solutions are tailored to meet the evolving needs of municipalities, optimizing performance and sustainability in water treatment processes. **800-848-7659; www.polydyneinc.com; Booth 4028**

Saf-T-Flo Chemical Injection Saf-T-Seal

The **Saf-T-Seal** elastomeric duckbill tip from **Saf-T-Flo Chemical Injection** can be a timesaver when added to injection quills dosing sodium hypochlorite or ammonia. These chemicals are prone to forming deposits, which eventually lead to a clogged injection quill. The tip can be added to any 3/8- or 1/2-inch injection quill to help reduce tip clogging, extending maintenance intervals. **800-957-2383; www.safflo.com; Booth 3761**



SAVECO North America BEAST

Designed specifically for septage receiving and other high-solids applications, the **BEAST** from **SAVECO North America** incorporates a dual-drive screening system that allows the drum speed

and auger speed to be controlled independently, allowing for shorter unload times, and higher capture efficiency. A sloped inlet along with a U-shaped flushing header keeps the screen inlet area free of debris buildup. The drum is supported from the top with an oversized slewing ring bearing, featuring a new auto-lube system, decreasing maintenance requirements and downtime. Additionally, it operates without rock traps or grinders, providing high performance and low life cycle costs. **815-636-8306; www.savecowaterna.com; Booth 2217**



SEEPLEX Smart Air Injection

Smart Air Injection is a **SEEPLEX** customized system solution for pumping over long distances. The system uses compressed air and polymer injections to convey sewage sludge, or other media with a dry matter content of 20% to 40%, over distances of up to 1,000 meters. This combination ensures a low pressure level in the delivery line, as well as low friction, which translates into a long life cycle and low operating costs. The system is easy to integrate into existing automation and control systems; reduces the pressure rating of the pipework and valves; and is an enclosed pipework system, eliminating unpleasant odors or rainfall dilution. Open-hopper SAI systems with Smart Conveying Technology reduce maintenance time by up to 85% with the maintain-in-place design, requiring no disassembly of discharge pipework. **937-864-7150; www.seepex.com; Booth 3929**



Smith & Loveless PISTA INVORSOR

Designed to set new standards in grit removal efficiency, the **PISTA INVORSOR** from **Smith & Loveless** captures ultra-fine grit particles down to 75 microns, offering 95% removal efficiency performance across all flow conditions. Model capacities range from 0.5 to 50 mgd, including the largest 75-micron unit capacities. It combines proven particle fine-capture methods: enhanced settling by inclined plates meeting a defined surface overflow rate with hydraulic forced vortex technology. Performance is never derated for wet weather events, which can carry 40 times the normal grit load. Variable inlet-





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800-898-9122; www.smithandloveless.com; Booth 4029

Sulzer Pumps Solutions HST 10

The **HST 10** turbocompressor from **Sulzer Pumps Solutions** cuts costs and boosts reliability for smaller treatment plants processing up to 3 mgd. Ideal for municipal and industrial wastewater treatment, it offers best-in-class energy efficiency through cutting-edge turbo technology and a permanent magnet motor. With no gears or mechanical bearings, it ensures minimal maintenance costs and high reliability. Compact and vibration-free, it reduces operational expenditure and has a significant positive impact on sustainability, making it a top choice for efficient and eco-friendly wastewater treatment.



203-238-2700; www.sulzer.com; Booth 6139

Vac-Con Non-CDL Titan

The 3-yard version of the Titan line of trucks provides the performance you'd expect from a **Vac-Con** machine with



minimal footprint. This is a suitable option for smaller organizations and those who need to have anyone on the team jump in the truck and go, as no CDL is required. The **Non-CDL Titan** weighs under 26,000 GVWR with full freshwater capacity. It features 3 yards of usable capacity in the debris tank and a simple operating system designed for all skill levels.

888-920-2945; www.vac-con.com; Booth 3009

Vactor 2100i

The **2100i** from **Vactor** provides the cleaning power needed to handle the toughest sewer challenges. This system employs advanced technology that not only enhances the performance of the equipment but the individuals who operate it —

meaning less fatigue, more comfort, push-button operation, greater precision and superior power and performance. An international dealer network maintains a vast inventory of spare parts and offers fast shipment to any region of the world. Altogether, the rugged, reliable unit is easy to operate and maintain, and is an easy choice when you are looking for quality equipment that is built to last.



815-672-3171; www.vactor.com; Booth 2757

Vaughan Conditioning Pump

The **Vaughan Conditioning Pump** returns to the 2024 Vaughan Maintenance Event during the Operations Challenge. As a proud, returning sponsor, they invite attendees to support the over 50 teams from around the globe working on specific scenarios



that include the popular pump. Then visit to discuss how it is designed to be used in different applications, saving teams from costly clean-out cycles and maintenance.

888-249-2467; www.chopperpumps.com; Booth 3717

VEGA Americas VEGAPLUS

The **VEGAPLUS** line of 80 GHz radar sensors from **VEGA Americas** uses precision focusing to deliver reliable measurements regardless of internal obstructions, changing temperatures, condensation or dust. The series is a standalone loop-powered sensor available as either a compact version with cable connection housing or with an IP68 housing and fixed cable connection. These sensors are easily adjusted via Bluetooth with a smartphone or tablet, making setup and diagnostics significantly easier.

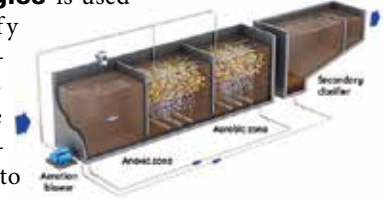


800-367-5383; www.vega.com; Booth 3561

Veolia Water Technologies ZeeLung and zeeDENSE

Upgrading wastewater treatment plants for capacity expansion or nutrient removal can be complex and expensive. The **ZeeLung** Membrane-Aerated Biofilm Reactor from **Veolia Water Technologies** is used

to intensify the conventional activated sludge process without having to construct new



bioreactor tanks. It expands biological capacity and improves nutrient removal in a simple, fast and modular way, while also reducing energy and mitigating GHG emissions. The **zeeDENSE** MABR combines the ZeeLung MABR and densification to increase biological and hydraulic capacity, resulting in super-intensification of activated sludge.

866-439-2837; www.watertechnologies.com; Booth 2229

Xylem Flygt Concertor

Xylem's Flygt Concertor offers wastewater pumping with reliability and efficiency. Its Adaptive N impeller ensures clog-free performance, handling large solids effortlessly. Specialized software adjusts speed and can reverse to clear blockages, minimizing downtime. Integrated monitoring and control adapt in real time, providing crucial operational feedback. With IE4-equivalent motor efficiency and compact design, it optimizes setup and operation, reducing life cycle costs. It's the ideal choice for maximizing performance and minimizing disruptions in wastewater management.



704-409-9700; www.xylem.com; Booth 4429 tpo



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EXPANDING CERTIFICATION OPPORTUNITIES

NASSCO's Building Sewer and Drain Inspection Program launches soon

By Sheila Joy

Designed to help achieve NASSCO's mission to set standards for the assessment, maintenance and rehabilitation of underground infrastructure, NASSCO training programs ensure that the inspections, recommendations and work performed are meeting proper standards to protect workers, communities and the environment.

NASSCO's training and education programs, including its Pipeline Assessment Certification Program, Lateral Assessment Certification Program, Manhole Assessment Certification Program and Inspector Training Certification Programs for cured-in-place pipe and manhole rehabilitation have become the cornerstones of our industry.

A new addition to these established training programs is NASSCO's Building Sewer and Drain Inspection Program, set to launch later this fall. The idea for this new program came about when a real estate agent representing a buyer in Northern Virginia inquired with NASSCO about a plumber's CCTV inspection on a pending real estate transaction. Viewing the video was not enough to convince the agent that the building pipe should be replaced (as recommended by the plumber), and as it turned out, it was not necessary. Cleaning and trenchless rehabilitation accomplished the goal to return the pipe to proper working order for the new home buyer.

NASSCO was also approached by the Pennsylvania Plumbing Heating Cooling Contractors Association to develop a standard for the inspection of building pipes for the same reason: To assure buyers that the property they are purchasing includes the inspection of building pipes and drains, just as roofing, electrical, plumbing and other mechanical and structural components of a building are assessed prior to purchase.

As a result of these requests, NASSCO's Lateral and Building Pipe Committee took on the task of forming a workgroup, headed up by Carl Marc Aurele of Formadrain, to develop a certification program for the proper inspection of building sewers and drains. After two years of development, the new self-paced online program will be launched later this year.

After two years of development, the new self-paced, online program will be launched later this year.

The BSDI Program consists of:

1. A detailed form which includes property location, inspector information, point of access/pipe characteristics, general inspection details and inflow characteristics including downspouts, floor drains, sump pumps, etc.
2. A self-paced online course detailing what to look for during an inspection, how to use the form and how to properly inspect, assess and document conditions of building sewer and drains.
3. A study guide for use during course study and for reference in the field post-certification.
4. An online exam (based course and form content) to provide individuals with certification that they have demonstrated basic knowledge in the inspection of building sewers and drains.

Once the program has launched, the BSDI workgroup will work on Phase 2, which will be a similar program designed for municipalities and system owners. The goal of this program will be to educate owners on the importance of consistent building sewer and drain inspection as a holistic part of an entire system, and to guide the student in the development of a program for their jurisdiction. Successful completion of an online exam will further recognize the owner as a BSDI Inspector.

Next on the horizon is a similar NASSCO certification program for drain cleaning, being developed by NASSCO's Operations and Maintenance Committee. Due to launch in early 2025, the program will complement BSDI and the two courses can be purchased as a bundle to fully educate the plumber and small contractor on the importance of proper inspection and cleaning. To learn more about NASSCO's growing library of education and training programs, please visit nassco.org. ♦



NASSCO is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 410-442-7473; www.nassco.org

Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

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Trainer: Jerry Weimer

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Trainer: Jerry Weimer

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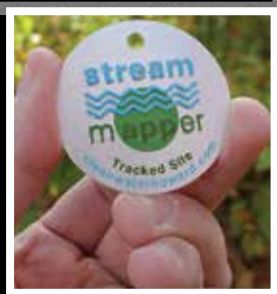


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Product Spotlight

Perimeter barriers provide reliable flood protection in an hour's notice

By **Dodie Wiesner**

With flood events hitting coastal U.S. regions at an ever-increasing rate, water and wastewater utilities stand to benefit from long-term, proactive flood-prevention solutions that can withstand multiple disaster events. Easy to assemble, unintrusive and built with long-term flood-prevention in mind, Portadam's FloodDefender perimeter barriers can protect critical water infrastructure in crucial moments during flood events, before being packed up until the next disaster strikes.

"In a pinch, if a wastewater treatment facility knows a problem is coming, they can deploy 150 linear feet extremely fast, in an hour with four people," says Rich Kenny, business developer for FloodDefender. "And then when it's done, it stores away compactly, and it will last decades."

Following Hurricane Katrina, Portadam's original cofferdam unit (which shares the same name as the company) was tested by the U.S. Army Corps of Engineers in their search for a more efficient and cost-friendly alternative to sandbagging. Since then, Portadam created the FloodDefender was based on

feedback obtained from the Army Corps to develop an on-land flood-prevention barrier that is rapidly deployable, volunteer-friendly, tool-free and doesn't require ground penetration.

FloodDefender became commercially available last summer in the public infrastructure market, including the municipal sewer and water sector.

"When you think about treatment plants, our system not requiring any ground penetration means you don't have to worry about hitting pipes," Kenny says.

The FloodDefender is specially engineered to balance long-term durability with easy temporary assembly. Main frames and link bars made of galvanized steel beams are slotted together to create a 4-foot-tall A-frame barrier across a 150-foot perimeter, coming together to divert floodwater from infrastructure using hydrostatic pressure. All the parts neatly fit in a compact stackable crate that can be transported via trailer.

"Those racks can be stacked three high, so you

could have 450 linear feet of protection in a 6-by-4-foot blueprint," Kenny says. "It could surround your entire facility if you want that kind of protection."

In addition, Kenny says the link bars are designed to be flexible, which enables the FloodDefender to curve and round corners in custom configurations. And, if that's not flexible enough for a particular use case, Portadam sells corner systems.

Since every water district has individual needs, Portadam's team works with communities to find the optimal flood-prevention solution, performing a flood-risk analysis on-site followed by a virtual site survey.

"It's a process that we go about meticulously to make sure it is the right solution for their particular location," he says. "So far, it's been very, very well received." **908-635-6969; www.portadam.com**



SPECIAL REPORT

OZ Lifting Products Alumi-Lite davit crane



OZ Lifting Products' portable Alumi-Lite davit crane is constructed from lightweight aerospace-grade aluminum and boasts exceptional strength while being easy to transport. At just 24 pounds for the 500-pound-capacity model and 47 pounds for the 1,000-pound capacity, the crane is a game-changer for on-site lifting needs. The Alumi-Lite offers effortless assembly with no tools required, and its 360-degree rotation and adjustable boom height provide superior versatility. All OZ Lifting Products' davit

cranes come equipped with a manual brake winch and a drill drive adapter, and AC and DC electric winches are also available. These cranes are made in the USA and each one is individually tested and certified at 125%, ensuring safety and reliability. **800-749-1064; www.ozliftingproducts.com**

ADS Environmental Services ForeSITE FS-UL monitoring system

ADS Environmental Services' new ForeSITE FS-UL system is designed for monitoring and alarming flood-prone sites. The system continuously measures remote site conditions, acquires data and communicates to cloud-based software where users have ongoing access. The FS-UL includes two user-configurable alarms for alerting to site condition threats. It is deployed in such areas as roadway underpasses, low-lying residential and commercial locations and areas adjacent to rivers and streams.

The system consists of a compact remote monitor with an embedded ultrasonic sensor. It is powered with a long-life battery capable of providing four-plus years of continuous power. It's unique, redundant, cellular communication connects to multiple providers, assuring high-reliability connectivity important during severe weather. The system is highly compact. Its small size makes it inconspicuous in public areas. Installation and mounting is fast and easy with system startup taking minutes thereafter. **800-821-6710; www.adsenv.com**

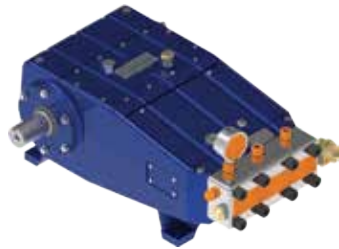


Aarcomm handheld remote control

The Aarcomm handheld remote control delivers performance and proven reliability, no matter what the conditions. With multiple machine types and configuration options available through the firmware, it is also compatible with business needs — just one unit can back up (or spare for) an entire fleet. Advanced radio frequency engineering and signal processing technologies deliver better performance in range, response time and durability. It has guaranteed IP66 and IP67 waterproof rating for both transmitter and receiver. The remote performs to minus 40 degrees F to survive tough job sites. Plug-and-play installation will get it up and running very quickly. **800-604-9218; www.aarcomm.com**



Jetstream of Houston 3000 Series UNX bareshaft pump



Jetstream of Houston has increased the maximum power input for its 3000 Series UNX bareshaft pump to 200 hp. To correspond with the boost in horsepower, Jetstream also developed larger plunger sizes for the pump, which is now able to achieve a flow rate of 7.6 gpm at 40,000 psi. This offers contractors greater power for a more diverse range of industrial cleaning and surface preparation

jobs, and an ideal flow rate for single-operator setups. The pump can produce pressures ranging from 6,800 to 40,000 psi and offers the ability to quickly change between operating pressures in the field with Jetstream's proven fluid end design. The 3000 Series is a triplex pump featuring three plungers available in varying diameters to produce the optimal flow rate for a full range of waterblasting jobs. **800-231-8192; www.waterblast.com**

Vactor new 27-inch vacuum for 2100i combination sewer cleaner

Vactor's 2100i combination sewer cleaner now has the option of a 27-inch vacuum for longer pulls and deeper suction for solid waste. To accommodate the longer vacuum, modifications to the 2100i include reinforcement on the debris body and more structural brackets for the debris body recess. Two silencers help reduce noise for a quieter operation. An additional benefit is it runs cooler with an additional inlet to keep the blower cool. The IntuiTouch cab controls and IntuiTouch control panel make functions as simple as the touch of a button while also combining all cleaning system functions into one control panel.



The IntuiTouch cab controls and IntuiTouch control panel make functions as simple as the touch of a button while also combining all cleaning system functions into one control panel.

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MUNICIPAL
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Asahi/America welcomes new district sales managers



Ben Muniga



Rob Snyder

Asahi/America welcomed two additions to its outside sales team: Ben Muniga and Robert Snyder. Muniga joined the company in May as district sales manager for the southeastern sales region comprising Alabama, Arkansas, Florida Panhandle, Louisiana, Tennessee and Mississippi. Additionally, Snyder joined Asahi/America in June as district sales manager for the central plains sales region comprising Colorado, Kansas, Missouri, Nebraska, Oklahoma and Wyoming.

William Mammen Jr. joins DSI/Dynamatic



William Mammen Jr.

DSI/Dynamatic welcomed William Mammen Jr. as its director of engineering, where he will be responsible for the development and sustainability of all products while also supporting business and investment strategies for Dynamatic. Prior to joining Dynamatic in April, Mammen developed military and automotive products/systems for over 30 years. He has worked on a variety of domestic and international programs with ship, vehicle, and component manufacturers including General Motors, Ford, Visteon, ArvinMeritor and DRS Leonardo.

Avanti announces director roles, changes to sales team structure



Chris Hamilton



Jacob Swanson



Keith Sisson



Chris M. Hamilton

Avanti made recent staff announcements. Chris Hamilton, director — municipal division, will lead strategic initiatives and operations to support grouting projects for municipal/government entities, specifying engineers and municipal contractors. Jacob Swanson, director — geotechnical division, will spearhead and drive initiatives for the geotechnical market, forge strategic partnerships and lead the company's efforts in advancing geotechnical solutions and ensuring project outcomes. Keith Sisson, director — industrial & dealer channel divisions, will oversee the development and execution of strategies to expand Avanti's dealer network, provide training and support and ensure alignment with organizational goals and market

demands. Chris M. Hamilton, director of national accounts, will head the strategic management of key client relationships and business development initiatives on a national scale, helping to drive growth and market expansion. The role involves collaborating cross-functionally to identify opportunities. The directors will still have territory responsibilities for specific states.

Public Utility Commission of Texas names new executive director

The Public Utility Commission of Texas voted unanimously to name Connie Corona as executive director of the agency. Corona has worked at the PUCT for 12 years. She first joined in 1997 as a policy analyst focused on the 1999 Texas Electric Choice Act, which introduced retail competition to the Texas electricity market. She rose to the role of director of electric policy analysis before joining NRG's regulatory affairs department in 2003. She returned to the PUCT in 2017 and has served as director of the competitive markets division, chief program officer, deputy executive director and, most recently, interim executive director.

InfoSense appoints LRIE as Florida service provider

InfoSense has appointed LR Infrastructure Evaluation as its sole factory-authorized service provider for performing acoustic inspections in Northern Florida. Founded in 2014, LRIE specializes in comprehensive wastewater system evaluations, including manhole and pipeline inspections, air control valve maintenance, valve exercising and smoke testing. They focus on ensuring CMOM compliance, risk assessment, and strategic planning, along with inflow and infiltration investigations.

City to add 6 miles of new storm sewers in Whitestone, Queens



The two projects, SE810 (orange) and SE811 (blue), improved stormwater drainage, water mains and local street conditions. The yellow area shows overlap of both projects.

The NYC Departments of Environmental Protection, Transportation and Design and Construction joined community members and local elected officials to celebrate the completion of two infrastructure projects totaling \$128 million in Whitestone, Queens, that added nearly 6 miles of new storm sewers in the neighborhood to improve stormwater drainage. Work took place on more than 120 individual blocks and included the conversion of almost 13,000 feet of combined sewers into separate sanitary and stormwater sewer systems which prevent 29 million gallons of pollution from being discharged into Flushing Bay each year. The first project, called SE810, was a \$72 million project that saw work on 70 individual blocks in Whitestone. Construction began in September 2018 and concluded in 2023. The adjacent project, called SE811, which saw work on 54 individual blocks, was a \$56 million project that began

in August 2021 and ended in December 2023, about eight months ahead of schedule. As part of the work, the catch basins that drain stormwater from the roadways were disconnected from the existing combined sewer and redirected to the newly installed dedicated stormwater sewer. ♦

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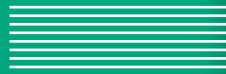
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WORTH NOTING

PEOPLE/AWARDS

New York City Parks and the **New York City Department of Design and Construction** announced that Starlight Park in the Bronx won the top award in the 2024 ALAY and ASLANY Transportation and Infrastructure Design Excellence Awards in the category of Open Space. The park features several design components, including some that address stormwater issues.

The **International Erosion Control Association** announced the winners of the 2024 Environmental Excellence Awards. The program acknowledges accomplishments within the erosion and sediment control and stormwater industries. Honorees include:

- Emerging Leaders Award: Nathan Collier, Lauren Deem and Rachel Reynolds
- Sustained Partner Award: Charles Riling, Jr.
- Sustained Contributor Award: Dr. James Spotts ♦

CALENDAR

Oct. 5-9

Water Environment Federation Technical Exhibition and Conference, Morial Convention Center, New Orleans. Visit weftec.org.

Oct. 9-11

Southeast Stormwater Association Annual Conference, Chattanooga Marriot Downtown, Chattanooga, Tennessee. Visit seswa.org.

Oct. 21-23

California Stormwater Quality Association Annual Conference, SAFE Credit Union Convention Center, Sacramento. Visit casqa.org.

Oct. 22-24

Tennessee Stormwater Association Annual Conference, Montgomery Bell State Park, Burns. Visit tnstormwater.org.

Feb. 25-28

International Erosion Control Association Annual Conference and Expo, Richmond Convention Center, Virginia. Visit ieca.org.

Mar. 5-7

Wisconsin Land and Water Conservation Association Annual Conference, (site TBA), Green Bay, Wisconsin. Visit wisconsinlandwater.org.

Apr. 8-10

Center for Watershed Protection National Conference, (site TBA), Puerto Rico. Visit cwp.org.

May 18-22

Association of State Floodplain Managers National Conference, (site TBA), New Orleans. Visit floods.org.

May 20-21

Washington State Municipal Stormwater Conference, Hilton, Vancouver, Washington. Visit wastormwatercenter.org.

Jun. 8-11

American Water Works Association ACE25 Conference, (site TBA), Denver. Visit awwa.org.

Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.

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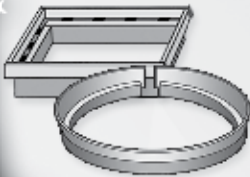
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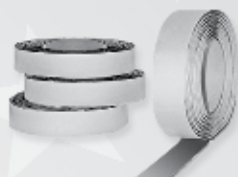
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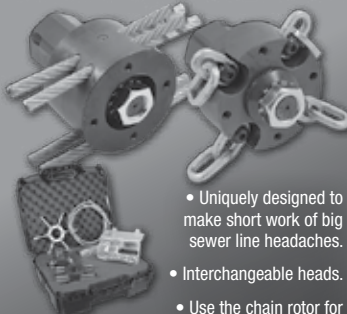
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What services does your company provide (categories)?

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Which types of sewer, storm & water repair, maintenance & inspection do you perform monthly?

- Jetting Manhole Rehabilitation Treatment Pipeline Rehabilitation & Relining TV Inspection Repair/Replace Excavating Vacuum Truck Service

What is approximate population of the area in which you provide service?

- 1-10,000 10,001-50,000 50,001-100,000 100,001-200,000 200,001-500,000 500,001+

How many vehicles do you currently have in service?

- 1-5 6-10 11-15 16-20 21+

What is your annual equipment budget?

- Under \$50K \$51K-\$100K \$101K-\$200K \$201K-\$300K \$301K-\$400K \$401K-\$500K \$500K+

If municipal, what percentage of your sewer and/or water work is done by private contractor?

- None 1-20% 21-40% 41-60% 61-80% 80%+

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