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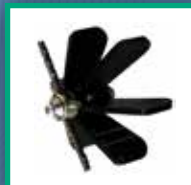
## BUILDING INFRASTRUCTURE FOR GROWTH

Florida city solidifies its water portfolio with dual sewer and water infrastructure projects

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Gary Hubbard  
Water Director  
Winter Haven, Florida

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CHEMICAL AND MECHANICAL ROOT CONTROL



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Luke Laggis

# THIS INVASION IS REAL

Protecting your utilities — and communities — from cyberattacks is a growing imperative

Everyone in this industry shares concern for the future of clean, safe drinking water. While that's critical for life as we know it, not everyone is as aware of the challenges and threats as you. And few understand the work you're doing to secure and protect those resources for future generations.

The city of Winter Haven, Florida, profiled in this issue, addressed its future water security by constructing a \$14 million, 4-plus-mile transmission main that provides the city with the capability to use more reclaimed water for irrigation in the years ahead. In a system that distributes nearly 40% of its water for irrigation, that's a big deal.

Other communities are developing new water sources from new wells to new reservoirs, system redundancies and desalination, water utilities are doing everything they can to make sure future generations have the resources necessary to live prosperously.

But it's not that simple. Securing water isn't the only challenge. Protecting it is another critical piece of the puzzle. In the past, that's typically meant protecting against pollution and contamination. Today, the threats are more diverse.

They're more difficult to see, and in some cases, even detect.

Earlier this year, the EPA noted that "Disabling cyberattacks are striking water and wastewater systems throughout the United States. These attacks, carried out by countries and criminals, have the potential to disrupt the critical lifeline of clean and safe drinking water as well as impose significant costs on affected communities."

I'm guessing a good percentage of the people reading this were born before the end of the Cold War. The Berlin Wall came down when I was a sophomore in high school. I didn't grow up with an outsized fear of nuclear war or a Russian invasion — I'd already seen Rocky Balboa defeat Ivan Drago, and a group of strong-willed kids from Calumet, Colorado defeat the Russian invasion — but it was impossible to grow up in that time and not view the Soviet Union as a threat.

Today, many of those fears are reborn with the rise of new threats that have the ability to reach directly to our homes, no matter where we live.

Water is essential for life — disrupt that flow and suddenly the Cold War is flowing directly to your tap.

Small Texas utilities were targeted in a series of attacks earlier this year. The attacks brought quick responses from local officials who were able to mitigate the damage, but a crisis averted doesn't equal a threat eliminated. And that threat extends to every utility in the country, and by extension, virtually every resident.

It might be easier for the average person to allay the threat of cyber attacks on water systems than the possibility of nuclear annihilation, but they both have deadly consequences, and dead is dead.

If your utility, regardless of its size, hasn't taken real, significant steps toward bolstering your cyber security, the clock is ticking. The time is now. Because the threat of cyber attack on your systems is more real than most of the things we feared during the Cold War.

Stay safe, and 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.

**Securing water isn't the only challenge. Protecting it is another critical piece of the puzzle.**

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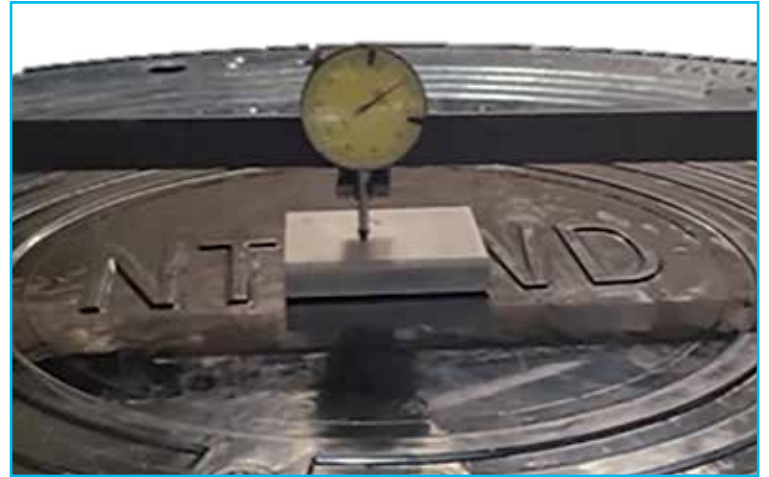
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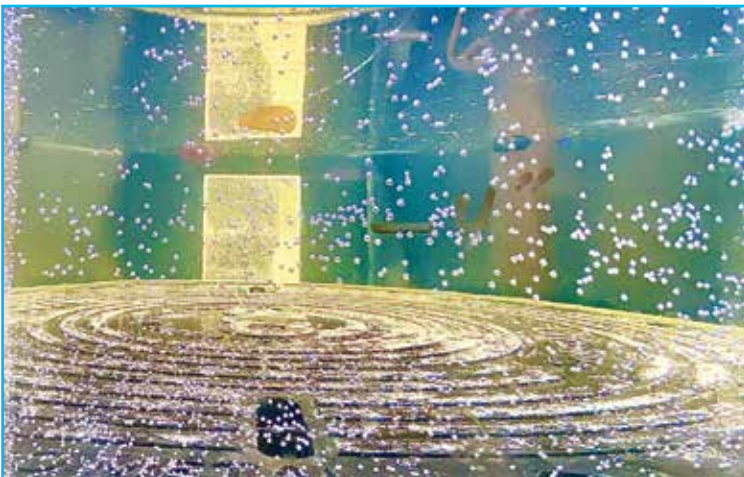


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## WATER SYSTEM CYBERSECURITY

### The EPA Is Cracking Down

An EPA survey revealed that over 70% of U.S. water systems have critical cybersecurity vulnerabilities. That's why the agency has issued an enforcement alert highlighting these threats and urging community water systems to conduct regular risk assessments and develop Emergency Response Plans.

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# FIGHTING ALL THE WAY

Portland levels up against challenging stormwater tunnel rehab project

By Giles Lambertson

There are large-diameter pipeline projects in which huge and heavy sections of pipe are wrestled and fitted into place. Then there are confined-space, close-tolerance pipe-laying projects where exactness and precision are paramount engineering concerns.

The Portland Bureau of Environmental Services simultaneously undertook both. The Oregon city's extraordinary \$11 million rehab project in 2020 was a test of engineering imagination, administrative expertise and the cooperative spirit of municipal and private sector organizations.

"It was a toughy," says BES construction manager Don Poletski. "The pipe fought us every step of the way."

"All the way" constituted about 4,000 feet through a 100-plus-year-old brick tunnel that was less than an inch larger in places



than the sliplined pipe, contained several challenging curves and was under a constant flood watch.

The good news: Despite an onslaught of expected and unforeseen challenges, the undertaking was completed on schedule, under cost and without loss of life. Three years later, the rehabbed segment of the city's stormwater system is functioning "exceptionally well. We knew if we could get it in there that it would perform really well," Poletski says of the liner pipe. "And it has."

### Getting lucky

It's called the Taggart Outfall and is a 6-mile-long section of stormwater pipe constructed of brick 115 years ago in a southeast section of Portland. The area was undeveloped in 1908 when construction crews tunneled through it, loosening soil with dynamite and hauling it away with horse-drawn carts. In places, the tunnel resembled a mining shaft a hundred feet deep with an air shaft running down to it to make it breathable.

In this underground space, the original construction crew methodically laid three concentric circles of brick against a wood form, working in groundwater that infiltrated the tunnel constantly. This is verdant Oregon, after all, in a city that annually receives 36 inches of rain.

The subterranean storm sewer meandered with the topography and, as it approached its terminus with the

Willamette River, almost doubled in size to nearly 10 feet in diameter. The 4,000-foot section most urgently needing repair was in this larger-diameter portion of the pipe.

"A hundred years is a long time," Poletski notes. "The pipe had heavily deteriorated. It was safe enough to put workers inside it, but it was near the end of its service life."

Planning to rehabilitate the pipe began in 2014 when the city selected a design consultant, Jacobs Engineering. Over the next half dozen years, engineering work on the project was split about 50-50 with the bureau's inhouse engineering staff.

Fourteen different methods of repairing the pipe were considered by the team. Because the area above the sewer had fully developed in the intervening century — populated with 18,000 homes and 1,500 industrial properties — open trenching was out of the question. One possible solution — bolting together short sections of curved steel plating inside the brick sewer — was possible but not a popular option.

"Nobody wanted to do that," Poletski says. "It was a 20th-century solution and had we chosen that method, we would still be there bolting plates together." Furthermore, the thick steel plating would have reduced the diameter of the sewer, lowering the flow capacity of a line already running full at times.

Then the project team had some luck. A commercial property that straddled a segment of the pipe and had been scheduled for development unexpectedly became available. "We were able to use it after all and it totally changed the picture," Poletski says.

This good fortune let the engineers pursue a first-choice method of repair: sliplining the brick pipe with short sections of fiberglass-reinforced pipe inserted through a hole opened on the property. The low-bid contractor, James W. Fowler Co., acquired a lease on the land and went to work. Removing some 40 feet of soil

**"I've put tens of thousands of feet of it under the city."**

Don Poletski



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**A 108-inch-diameter section of fiberglass-reinforced pipe is maneuvered into place during sliplining of the Taggart Outfall in Portland, Oregon.**

above the pipe, the contractor exposed the three-ply brick sewer and sawed open the top of it.

A sliplined pipe, of course, raised the same concerns among engineers as bolted steel plating — that is, a reduced flow in the sewer. For 18 months, the issue was researched using flow monitors and computer modeling, a period Poletski recalls with evident exasperation.

Finally, it was determined that, though the diameter of the pipe would be less, the interior surface of the fiberglass-reinforced pipe was slicker than that of the brick face of the old sewer. Consequently, the flow rate would be slightly increased, offsetting

the lessened capacity. Reassured, engineers pressed on.

### **Slow process**

With the old sewer ready to receive the new pipe, things got interesting. The issue was tightness. A \$200,000 laser scan of the sewer had determined how long a section of fiberglass-reinforced pipe could be maneuvered through the old brickwork. The answer was an 8-foot-long pipe with an outside diameter of about 108 inches.

To test this premise, a wood mock-up of the pipe was constructed, assembled inside the old brick sewer and winched through the sewer. “Pinch points” were painstakingly navigated, including the curves. The biggest issue was a 270-foot section where brickwork had been reinforced using the aforementioned bolted-together curved steel plating. The internal strengthening was required when an industrial building was constructed in 1959 on the property above the sewer.

Clearance of the mock-up through this steel section was less than an inch. It required the grinding down of the heads of some bolts to allow passage, yet it did pass through, giving a final green light to engineers. In due course, a full week was spent moving the first fiberglass-reinforced pipe section through the narrowed area.

How to move the pipe sections through the old sewer then became the problem. The contractor had planned to use a modified telehandler. However, even an expert equipment operator could find it daunting to maneuver a three-ton, eight-foot-long section of pipe through a tunnel just a few inches larger in diameter without periodically ramming the leading edge of the pipe into the brickwork.

The solution? A locomotive. Specifically, Fowler suggested using a battery-powered mining locomotive that would run unerringly on two-inch tubular steel tracks bolted and grouted into the bottom of the brick sewer. A LIDAR scan determined exact placement of the tracks to keep the locomotive and sections of pipe centered and away from surrounding brick walls. A month was required just laying the track.

The locomotive solution was especially appealing because this process of transporting pipe sections would have to be replicated 300 times

**“The locomotive gave us a solution that was repeatable.”**

**Don Poletski**

## **DEALING WITH DIFFICULT CONDITIONS**

When the original Taggart Outfall sewer was constructed in 1908 in Portland, Oregon, the lives of six construction employees were lost while tunneling through the ground in relatively primitive fashion. At the time, the deaths were deemed an acceptable casualty rate.

Don Poletski wanted no part of it. The construction manager for Portland’s Bureau of Environmental Services takes safety of employees personally.

“Construction management and safety are synonymous,” he says. “Employee safety guides every decision we make. The six deaths during the original construction project were sobering to our team.”

The Taggart sewer project would entail work deep underground in confined spaces using heavy equipment — all the ingredients for injury were there. And then along came the pandemic. “That made it exceptionally challenging. It hit right in the middle of our construction, and social engineering dictated that I couldn’t go on site. Under those circumstances it was incredibly difficult keeping people safe. It was incredibly challenging.”

A wildfire outside Portland added to the headaches at one point, reducing air quality to dangerous levels. Yet neither fire nor pestilence was the most chronic worry. Flooding was. The large-diameter storm sewer served a watershed that was capable of filling the nearly 10-foot-in-diameter sewer with water within an hour.

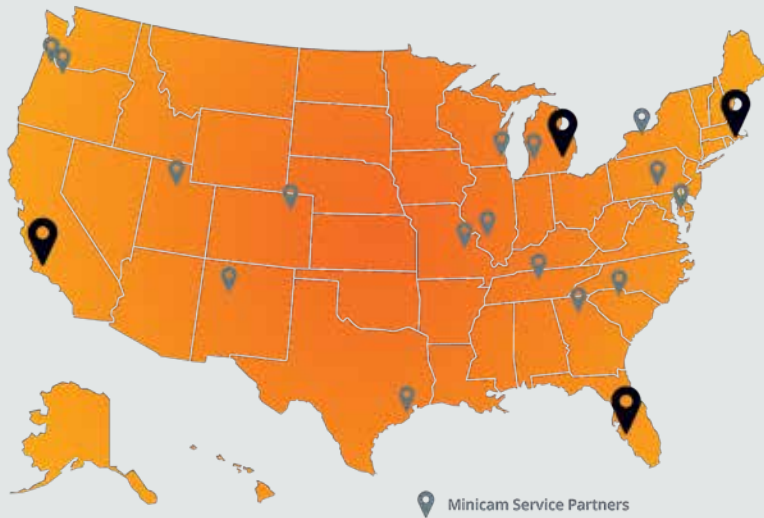
To reduce the flood danger, the project was scheduled during a relatively dry season in rainy Oregon, with construction crews working 24/7 to get the job done during the season. Weather conditions were constantly monitored and the approach of a summer storm had people scrambling to get out of the pipe.

“One time a random storm came in and we had to evacuate,” Poletski recalls. “We got everyone out of the tunnel eight minutes before it flooded.”

A related aggravation was the occasional illicit dumping of toxic substances into the sewer at night. The pipe always had 3 or 4 inches of flow, which workers got used to having at their feet, but the water would carry the toxic stuff to them. One night an apparent 55-gallon dump of toxic fluid led to an evacuation. Poletski says they never did identify the dumper.

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**“It was a 20th-century solution and had we chosen that method, we would still be there bolting plates together.”**

**Don Poletski**

— that’s how many individual sections were to be installed. “The locomotive gave us a solution that was repeatable,” says Poletski.

A battery-powered locomotive, instead of diesel-powered, was necessary because of the confined space in which it would be operating.

Insertion of the fiberglass-reinforced pipe began apace, with crews working 24/7. It was a slow process. Poletski says 14 sections of pipe were the most installed in any one day. The curves in the line required shorter sections of pipe — the shortest being 3 feet in length — and with different bevels on inside and outside edges. “It was a tremendous challenge fitting the pipes together,” Poletski recalls. Ends of pipe were seated securely using a jacking system.

Every 100 feet, grout was inserted between the outside of the sliplined pipe and the old brick sewer, effectively bonding the two structures for extra stability. “If you put too much pressure in the grouting, you collapse the inner pipe,” says the construction manager, another ticklish dimension of the project. It never happened. The tracks, incidentally, were buried in grout. They had been laid with spaces under them so the grout could penetrate the whole area.

### Coming together

Completed three years ago, the project continues to be satisfying for everyone involved with it, including the 46-year-old Poletski, who has worked at the bureau for 15 years. He expresses a lot of confidence in the fiberglass-reinforced pipe the team installed. “It has been around a long time and is a very robust and highly engineered pipe. I’ve put tens of thousands of feet of it under the city.”

The Taggart Outfall project experience was made more intense for everyone by the arrival of COVID just as actual construction began. The immediate impact was limitations on gatherings by engineering staff and some virtual management of team members. The pandemic also sequestered many residents in their homes, which led to more construction noise complaints than usual. Generally, however, Portland residents were supportive of what they came to understand was not a typical utility project.

The construction manager, who was a consulting



**The 6-mile-long Taggart Outfall, built of brick 115 years ago, was sliplined with short sections of fiberglass-reinforced pipe.**

engineer before joining the city staff, is currently overseeing other sewer repair work in the city, including a \$25 million rehab project under a stretch of Interstate 5. Though 99% of Portland’s sewer and wastewater maintenance is performed in-house, any big or deep work on the system is contracted out.

Of all the challenges that had to be overcome in the Taggart project, the most satisfying to Poletski was surprising. “The most impressive accomplishment was the teamwork we all developed. We all wanted the best solution given the constraints. We believed in each other. When you have a team that has bought in, every-

thing is solvable.

“It was really, really important to come up with the best technical solution, one that would give the best service life and so on. We accomplished that despite an incredible amount of adversity. The pandemic. A massive log fire at one point when air quality was bad. We succeeded through teamwork, trust and talent, the three Ts. It’s said you can’t have all that in a low-bid environment. We proved that you can.” ♦



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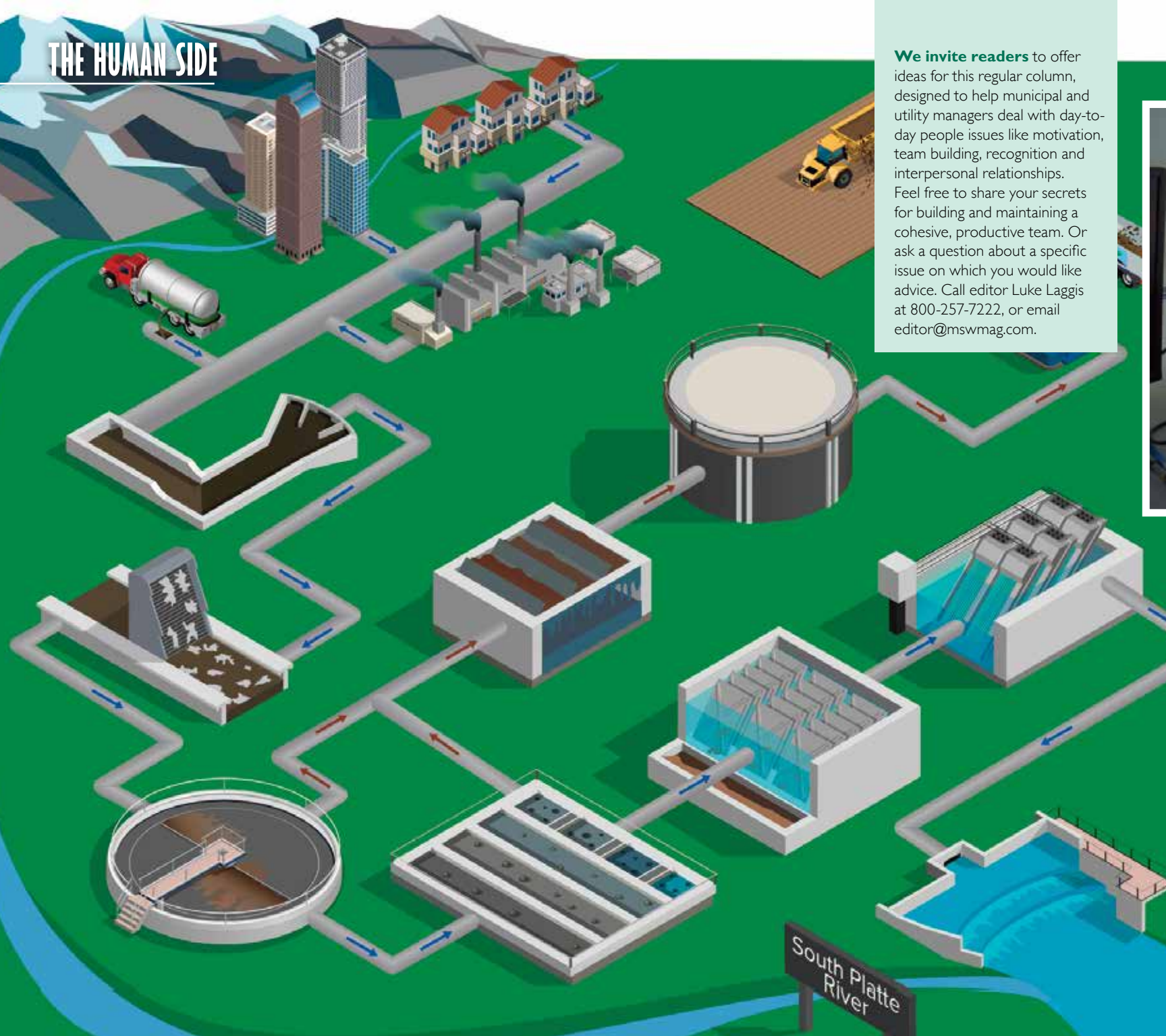
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## EXPANDING EDUCATION

Utility's website becomes a powerful medium for comprehensive public outreach

By **Sandra Buettner**

The Metro Water Recovery board of directors asked for a presentation to help them better understand the wastewater treatment processes. They didn't realize how useful it would be for larger public education efforts.

The utility provides wastewater treatment services to 61 local governments, from which its board members are appointed. Its 805-square-mile territory includes 2.2 million people in Denver and parts of five Colorado counties. It treats 135

mgd of wastewater from most of metro Denver, operating the Robert W. Hite Treatment Facility and the Northern Treatment Plant.

### Interactive website

The board sought a way to understand how water quality improves through the treatment process. Muzit Kiflai, senior continuous improvement manager,



**“Teachers love the website because they learn along with the students ...”**

**Colleen Miller**

observes, “Instead of a one-time presentation, we created the website. It became an educational resource that we update every six months to keep the information current.

The website took six weeks to complete, and the content was created internally. Kiflai relied on wastewater operators for process descriptions and tapped the Environmental Services, Engineering, and Technology and Innovation departments. The site was promoted on Facebook and by word of mouth. As of fall 2023, it had logged more than 7,000 visitors.

A virtual classroom experience was first explored in 2020 while the COVID-19 pandemic was still relevant. Some schools were still not back to in-person classes, and educators wanted a virtual tour of the treatment facilities. The live tours are limited to 28 attendees, not enough capacity for larger classes; that made the virtual classroom experience ideal.

Employees took the idea to their children’s teachers and reached out to educators in their families to let them know about the resource. From there, word spread.

**Treatment map**

Visitors to the website can click on all the treatment process stages and get a detailed explanation. Colleen Miller, public information specialist, presents the virtual classroom to students and educators through Zoom. She includes the website as part of her program; the virtual experience takes about 30 minutes.

“Teachers love the website because they learn along with the students and then use it afterwards to continue teaching about the wastewater treatment process,” Miller says. “Home-schoolers have called us, and so have private schools. Parents who have special-needs children have asked for one-on-one presentations. It is useful for all class sizes.” As of fall 2023, more than 7000 visitors to the website have clicked on the tool.

The website has also been helpful for educating utility contractors, consultants and vendors and for onboarding new employees. Miller has tweaked the



**Muzit Kiflai poses with the Public Information and Education award Metro Water Recovery received in the E-media category from the National Association of Clean Water Agencies for the interactive website.**

virtual classroom presentation for groups of different ages, such as retirees, civic clubs, scout troops and community educators.

“A rural school in Wyoming asked for a presentation,” Miller says. “They are out of our service area, but we were happy to help. Those students only attend school two days a week because their school is an hour from their homes.”

Kiflai notes that the website and virtual classroom have exceeded expectations. The website ([treatment.metrowaterrecovery.com/](http://treatment.metrowaterrecovery.com/)) won a 2023 Public Information and Education award in the E-media category from the National Association of Clean Water Agencies. ♦





Antonio Hernandez of B+B Underground muds the seams inside a manhole during construction of a new manhole in Winter Haven, Florida.

# BUILDING INFRASTRUCTURE FOR GROWTH

Florida city solidifies its water portfolio with dual sewer and water infrastructure projects

By Ken Wysocky

Facing two conflicting trends — rapid population growth and a limited supply of water — the city of Winter Haven in Central Florida responded with an ambitious \$13.9 million project that will eventually reduce the amount of water pumped from a diminishing aquifer.

A key component of the project is a 22,850-foot-long, 24-inch-diameter transmission main that provides the city with the capability to use more reclaimed water for irrigation in the years ahead. That's no small matter; between 38 and 40% of the water the city pumps from the Upper Floridan Aquifer — or about 4 million gallons per day — is used for irrigation, says Gary Hubbard, director of the city's water department.

Composed of PVC and HDPE pipe, the transmission main connects a wastewater treatment plant on the city's south side to a second and smaller plant on the north side. The north side plant produces only about 1 mgd of reclaimed water for irrigation, which was insufficient to meet demand during dry seasons, he says.

But the transmission main enables the south side plant, which can produce up to 4 mgd of reclaimed water, to supplement the north side plant's production as needed to irrigate things like golf courses, parks, residential subdivisions and so forth.

All of the treated water from the south side plant used to be discharged into a waterway known as the Peace Creek Canal, built in the early 1900s to drain water from land to make way for agricultural use. The canal eventually flows into the roughly 100-mile-long Peace River and then into Charlotte Harbor, northwest of Fort Myers.

While excess reclaimed water still is discharged into the canal, it eventually will be used for irrigation after an underground transmission "ring" around the city is completed.

"That will allow us to push that reclaimed water to wherever we need it and even allow us to use it



Winter Haven Water Director Gary M. Hubbard on site for the construction of a new lift station.

**“We’re always looking five years or more into the future and trying to anticipate the needs of the community.”**

Gary Hubbard

to recharge the aquifer,” Hubbard explains. “The ability to divert more reclaimed water to where it's needed will greatly increase the flexibility of our water portfolio.”

Concurrent with the transmission main project, the city also installed a 23,350-foot-long, 24-inch-diameter major wastewater force main (using both PVC and HDPE pipe) that runs from a master lift station to the aforementioned wastewater treatment plant on the city's south side.

The line replaced a 60-year-old, 30-inch-diameter major wastewater force main. Made from ductile-iron pipe, the main had reached the end of its useful



## PROFILE:

Winter Haven Water Department, Winter Haven, Florida

**POPULATION SERVED:**  
About 100,000 people

**PRIMARY WATER SOURCE:**  
Upper Floridan Aquifer

**WATER SERVICE AREA:**  
About 78 square miles

**WATER CUSTOMER BASE:**  
Roughly 40,000 accounts

**WATER INFRASTRUCTURE:**  
9 treatment plants, about 500 miles of water mains, 13 in-ground storage tanks, five elevated water tanks, around 2,546 fire hydrants

**CAPACITY OF WATER TREATMENT PLANTS:**  
Up to about 14 mgd

**AVERAGE DAILY PRODUCTION:**  
9.5 mgd

**WASTEWATER INFRASTRUCTURE:**  
2 wastewater treatment plants, around 330 miles of sewer mains, about 5,597 manholes, 225 lift stations

**SEWER ACCOUNTS:**  
About 27,000

**WASTEWATER-TREATMENT CAPACITY:**  
Roughly 9.7 mgd

**AVERAGE DAILY TREATMENT:**  
About 5.5 mgd

**EMPLOYEES:**  
About 110

**WEBSITE:**  
[mywinterhaven.com/202/about](http://mywinterhaven.com/202/about)



The lift station will serve a new 4-mile-long forcemain that will flow to the treatment plant on the city's south side.

**“The ability to divert more reclaimed water to where it’s needed will greatly increase the flexibility of our water portfolio.”**

**Gary Hubbard**

“Our location doesn’t help us,” Hubbard says. “So it’s important to save every drop of water we can.”

Faced with significant population growth and the need to increase water supplies, water utility officials in Central Florida can turn to sources such as surface water, the Lower Floridian Aquifer (which contains water that’s saltier than the Floridan Aquifer’s water), treated wastewater and seawater.

But these alternate water sources would cost more because they need more treatment and pumping.

As such, Winter Haven has turned to using reclaimed, or “reuse” water, for irrigation instead of using aquifer water. The city has been using this highly treated wastewater since the early 2000s, Hubbard says.

In the future, it could be used to restore wetlands or even recharge the aquifer, he notes.

### **Educating the public**

The project started in early 2021 and finished in December 2022. Challenges large and small emerged along the way, including shifting project timelines due to pandemic-related supply chain issues.

On the plus side, the use of parallel horizontal directional drilling significantly reduced traffic disruptions, Hubbard says.

life and posed a threat of “catastrophic failure” because it carries roughly 4 mgd of raw sewage.

“We decided to address the two issues with one project,” Hubbard explains. “It represents our largest pipeline project to date.”

### **A major undertaking**

Both installations followed the same path and involved approximately 11,400 feet of horizontal directional drilling that went as deep as 65 feet to pass under wetlands, roadways, utility lines, canals and other obstacles. The bores were drilled side by side, about 6 feet apart, except for one stretch where they were stacked vertically to avoid encroaching on private property.

The bores were broken into sections as needed, with lengths ranging from 35 to 3,600 feet. Certain sections were installed via open-cut trenching and one section was laid with jack-and-bore technology to go under a railroad line, he said.

Unusually rapid population growth was the catalyst for the project. Winter Haven is in Polk County, which is the fastest-growing county in the United States.

“The average population growth for the last five years or so is more than 4%, which is tremendously fast (the city’s population is nearly 60,000),” Hubbard says. “For most communities, 1.5% is pretty good growth. But 4% is out of sight.”

The bores were performed by Florida-based DBE Utility Services, the project’s prime contractor. The engineering consultant was Florida-based Jones Edmunds & Associates.

As if those projects weren’t enough, the city — in a separate project — also installed a 6,700-foot-long, 16-inch-diameter water main that ties into the city’s water distribution system and eventually will connect to a new water treatment plant.

### **Limited water supply**

To understand why the project was needed, it’s helpful to understand the city’s water dynamics. Winter Haven gets its water from the Upper Floridan Aquifer, which is about 800 feet underground. Spread throughout the community, 21 wells pump approximately 11.7 million gallons per day to nine water treatment plants.

The aquifer water comes from rainfall and needs little treatment — just aeration and chlorination — because it’s so pure. The aquifer also is connected to rivers, lakes and streams, including the 50 lakes that lie either within or border on the city limits, which is why Winter Haven is known as the “Chain of Lakes City.”

Across Florida, aquifer over-pumping has reduced stream flows, lake levels and spring flows. In fact, around 2017, the state capped the city’s aquifer pumping to 14 mgd, Hubbard says.

Furthermore, Winter Haven sits at the top of the local watershed, so all rainwater flows away from the city, as does groundwater.



The new 24-inch-diameter transmission main provides the city with the capability to use more reclaimed water for irrigation in the years ahead.

*Photo courtesy of Winter Haven*

Constant communication with residents and businesses was critical. The utility sent letters to residents, used social media to educate the public about everything from road closures to timeline changes and even met with residents face to face.

“Providing face-to-face communication with many of the residents before and during the project was crucial to addressing ingress and egress challenges from their properties,” Hubbard says. “And both the city and Jones Edmunds frequently had staff on-site to educate the public around the project area.

“This allowed DBE Utility Services supervisors to remain focused on the task at hand: keeping the project moving.”

### Enhancing connectivity, communications

The project also provided an opportunity to expand fiber optic service. About 32,000 feet of 4-inch-diameter fiber-optics conduit was installed inside the 30-inch-diameter bore for the new force main; the force main pipe and conduit were pulled in simultaneously, Hubbard says.

Drilling mud filled the annular space not filled by the force main pipe and the fiber-optics conduit.

The fiber lines are part of a broader city plan to increase connectivity and communication capabilities. The city already has installed more than 100 miles of fiber-optic conduit since around 2004.

Some of the fiber optic cable installed inside the conduit with the new force main will provide a communication link between the city’s master lift station and a new master lift station under construction.

“Almost any time we install water or wastewater lines, we also install conduit for future fiber optic cable,” Hubbard says. “We call it a ‘dig once’ philosophy.”

“We’re only using 25% of the capacity in that fiber-optics conduit, so there’s a lot of room for future expansion,” he explains.

After fiber-optic cable is installed, service providers such as Spectrum and Verizon either buy or lease as much as they need, essentially funding the line installation without any impact on water and sewer rate-payers.

“Our city is very innovative,” Hubbard notes. “We’re always looking five years or more into the future and trying to anticipate the needs of the community.”

### More work on the horizon

More projects loom for the utility as it continues to contend with population growth. Its two wastewater treatment plans — one is 53 years old and another will be 50 in 2026 — need to be replaced. Plans call for consolidating those plants into one new facility, capable of treating 12 mgd; the plant will be built by around 2028.

The plant will be capable of producing more reuse water than the two existing plants, which would reduce aquifer pumping. In addition, that plant eventually will produce potable reuse water, which would even further enhance the city’s water portfolio and bolster resiliency and sustainability.

The infrastructure upgrades also are necessary to ensure future economic growth, Hubbard adds.

“The city is experiencing rapid economic

## A GEM OF A PROJECT

The city of Winter Haven eventually will be encircled by a roughly 30-mile-long underground transmission pipeline for reclaimed water that will help restore roughly 19 wetland areas, providing a bounty of recreational opportunities and enhancing wildlife habitat for the Central Florida city.

The wetlands — about 5,000 acres in all — will become part of a project known as the Sapphire Necklace, a connected chain of natural jewels: parks, lakes and green spaces. They’ll be connected by an approximately 40-mile, multimodal trail system. The 12-foot-wide trail eventually will connect with a statewide trail system, says Gary Hubbard, director of the city’s water department.

But the wetlands, which historically have been ditched and drained, will serve another purpose, too: help recharge the Upper Floridan Aquifer from which the city pumps its water.

The Sapphire Necklace will include about 20 lakes within nature parks. (Winter Haven is known as the “Chain of Lakes City” because 50 lakes of varying sizes lie either within or border on the city limits.)

The wetlands will be filled by reuse water from a new, \$420 million wastewater treatment plant expected to be built by 2028. The plant will be capable of treating 12 million gallons of sewage per day, Hubbard says.

The restored wetlands will also help fill local lakes, which are well below their predevelopment levels, according to the Southwest Florida Water Management District.

The transmission ring, which will consist of 20-inch-diameter PVC and HDPE pipe, will be completed in around five years. It will connect to both wastewater treatment plants and allow the city’s water utility to transfer reclaimed water anywhere it’s needed around the city.

The western half of the loop is already completed — a 22,850-foot-long, 24-inch-diameter reclaimed water line completed in 2022. The rest of the transmission ring is being built as development occurs; developers are required to partially pay for these various segments, he says.

“We don’t want to arbitrarily install the transmission ring and then have to move it to accommodate the best route through properties,” Hubbard adds. “So we’ll do it in conjunction with development.”

Excess water from the wetlands will be used to recharge the aquifer through a combination of injection wells and rapid-infiltration basins, Hubbard says.

“Over a 50-year period, those wetlands could store 83 billion gallons of water,” he says. “Projects such as this are part of a bigger plan to restore, recharge, reclaim and reuse water resources in Winter Haven to the fullest extent.”

growth and development,” he points out. “Without further investments in our infrastructure and making the appropriate upgrades to our system, we are not meeting our mission to provide exceptional service to our community.

“We will continue to aggressively pursue improvements to our systems that are in the best interests of our customers.” ♦



# WHEN OSHA SHOWS UP

Inspections aren't necessarily a bad thing, especially when you're prepared

By **Ronnie Freeman**



**T**he Occupational Safety and Health Administration's mission is to "assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance." Sounds great, so why are many employers afraid of OSHA one day showing up at their door?

The fear could be the result of having things to hide and knowing a heavy fine awaits them. Another reason could be that they just don't know what to do if OSHA shows up at their door.

So, is your utility or organization ready? If not, or if you're not sure, this article is for you.

OSHA cannot employ enough inspectors to cover all the companies that exist in the United States so their inspection criteria is going to be "worst first," typically companies and organizations that have high danger occupations or that have had multiple violations in the past. Generally, their priority for inspections is imminent danger, fatality or catastrophic incident, complaints and referrals, targeted inspections and follow up inspections. In our industry, employee complaints and referrals from onsite contractors are usually why OSHA shows up.

Now the bad news: if OSHA shows up at your door, it will be unannounced. You do have the right to refuse entrance, but more than likely, the officer will come back with a search warrant for your facility. So the best thing to do is cooperate fully throughout the inspection process. This will work in your favor in the long run. Generally, if they do come to your office or job site, it's for a reason; perhaps because of an employee complaint or because our industry falls into a high hazard category. We do a lot of confined-space entries and dig a lot of trenches, which are considered high hazards.

The first thing the officer will do is hold an opening conference in which they will explain why they are there and what areas they want to inspect. Make sure someone from management is at this conference. Also make sure you see the inspection officer's identification, which should include a USDOL ID card with a photo and a serial number. At this opening conference, the officer is more than likely going to want to see your injury/illness records, written plans, safety policies, training records, equipment inspection records and other documents that are



related to why he or she is there. It is important to keep accurate records and keep them up to date.

During the opening conference the officer will explain the scope of their inspection. Ensure that you stick to just those areas. Do not volunteer to give a plant tour regardless of how safe you think the plant may be. The inspector is obligated to cite you for any violations that are in “plain view.” Make sure your employees know not to lie to the compliance officers even if it’s an effort to protect the company. This could result in stiffer penalties and even civil penalties for you as the employer.

When the inspection begins, you have the right and should follow the officer as they inspect your workplace or job site. Be cooperative and friendly. They have a tough job and being uncooperative only makes it harder and more likely that they will find reasons to cite you.

During the inspection, the officer may interview employees, take photos, instrument readings and take notes. As they are taking pictures you should also so that you have documentation of the violations as well. If they find violations the officer will point them out. Feel free to ask how you should correct the violations

**We do a lot of confined-space entries and dig a lot of trenches, which are considered high hazards.**

and if you can correct the violation immediately do so. Usually, the inspecting officer will give you some direction on correcting the hazard. This kind of good-faith effort will go a long way with the inspecting officer. Do not attempt to argue your point; this is not the time.

When the inspection is done, the officer will hold a closing conference and will discuss the problems the officer found and give you the opportunity to ask questions. They will also tell you what citations they are recommending and the timeframes under which you must correct the noted problems. The actual citations or fines will come from the area director, not the officer. Some factors that will affect the amount of the fines will include the nature of the violation, your history of violations (if they have been there before), your good-faith efforts to correct the violations and the size of your operation. If you want to reduce the fines it is important to contest the fines within the 15 business days of receiving the official paperwork in the mail.

In closing, an OSHA visit doesn’t have to be as bad as it’s made out to be. In fact, it could be a good thing if violations are corrected thereby eliminating hazards that could result in a serious injury or even a death. OSHA inspection officers will work with you if you

show good faith in correcting violations. They are simply trying to ensure we have safe workplaces for our employees. ♦



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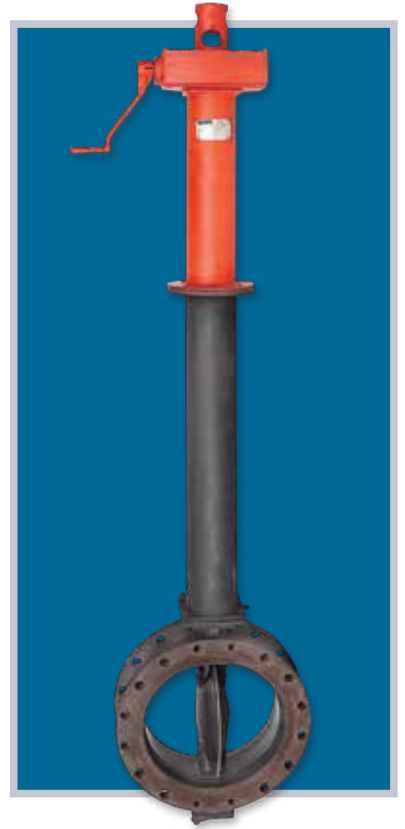


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# SELECTING THE RIGHT VALVE

Conditions and performance requirements will dictate the best valve options for your specific water application

By Jason Hackbarth

**H**ave you ever installed a valve only to have issues later because it was the wrong valve for the job?

There are many options and several conditions that need consideration when purchasing the right valve for the right application. It's important to understand the primary benefit of each valve design and the condition of the environment they are going to operate in. The goal is to choose the right valve to perform efficiently for its expected life, and at the most economical price. In terms of the water industry there are three areas that have different requirements.

## Wastewater

Valves used in wastewater conditions encounter solids, sludge (thick semisolid mixture), slurry (thin semiliquid mixture) and chemicals. These valves need to be resistant to clogs and leaks. Valves that are good for this kind of environment include check valves, knife gate valves, plug valves and solid wedge gate valves.

## Potable Water

Valves in contact with potable water need to be made from materials that are safe for human consumption, and resistant to corrosion. NSF 61 is the pri-

mary certification by the National Sanitation Foundation for contact with potable water and is required by the American Water Works Association for water distribution valves. Choosing a reputable manufacturer that meets AWWA standards will help with quality assurance. Valves that are good for potable water include butterfly valves, check valves, double disc gate valves, knife gate valve, resilient wedge gate valves - rising or nonrising stem, control valves and solid wedge gate valves.

## Fire Protection – UL/FM approved Valves

Underwriters Laboratories listing and/or Factory Mutual Research approval are often required for products used in fire protection systems. Valves used in fire protection need to handle high temperatures and pressures while providing quick operation. These valves may not be used very often, but need to be reliable on the occasion they are needed. Valves that perform well here include check valves, control valves, post indicating butterfly valves and resilient wedge gate valves — rising stem valves (OS&Y) or post indicator valves.

Knowing the attributes of the different kinds of valves helps with selecting a suitable valve for the right environment and application. Here are key character-

istics of the valves that are ideally suited for wastewater, potable water and fire protection.

**Butterfly Valves** — Butterfly valves are a quarter-turn valve, making it fast to actuate. The circular disc is mounted on a stem in the center of the valve. It is also great for shutting off and regulating flow. Butterfly valves are lighter in weight and have a small lay length, making a more space efficient installation. An advantage of butterfly valves is that, in throttling applications, forces on the rotating disc are balanced allowing relative ease of operation even at high flow velocity.

**Check Valves** — Check valves only allow flow in a single direction, and automatically close if the flow reverses and can open with 1 psi of pressure. Check valves eliminate back flow and are self-automated.

**Double Disc Gate Valves** — They have a multi-turn nonrising stem. They are available with roller tracks and scrapers to aid in clearing the waterway when closing the valve when installed on the side. They are not meant to throttle, but make great shut-off valves.

**Knife Gate Valves** — They have a gate that moves up and down allowing full flow or isolation of the line. They have a thin gate that can cut through media. Knife gate valves also have a small lay length. An advantage of knife gate valves is that they are extremely versatile. They are offered in a variety of abrasion-resistant and chemical-resistant materials for applications ranging from dry powder to drinking water.

**Post Indicating Butterfly Valves** — These valves are used with post indicators to show whether the valves are in the open or closed position. Otherwise, it has all the attributes of a butterfly valve being a quarter-turn valve with a circular disc mounted on a stem in the center of the valve. The rotating disc is great for shutting off and regulating flow. They are lighter in weight than other types of valves and have a shorter lay length.

**Plug Valves** — These are a quarter-turn valve that have a tight shutoff. Plug valves are great for regulating flow and they function very well in high-solids applications, like sludge and slurries.

**Resilient Wedge Gate Valves – Rising or Nonrising Stem (NRS or OS&Y)** — These are multi-turn actuation valves with a vertically moving metal gate that is encapsulated in rubber. OS&Y valves have visible confirmation as to whether the valve is in the open or closed position. These valves have a fully open waterway with smooth epoxy-coated surfaces for maximum flow with little to no head loss. A smooth-bottom waterway allows debris and silt to pass through the valve when these valves are installed vertically. They are great shutoff valves and are not meant to throttle flow.

**Resilient Wedge Gate Valves – Post Indicator Valves** — These valves are used with post indicators to show whether the valves are in the open or closed position. They have all the attributes of the resilient wedge gate valve mentioned above making them great shut off valves.

**Solid Wedge Gate Valves** — These utilize multi-turn actuation that moves the gate vertically. They are available as rising and nonrising stems. Solid wedge valves have a full flow waterway to prevent clogging and are not meant to throttle flow. The gate is made of exposed metal, making it suitable in abrasive environments and more economical. These are great shut off valves.

**Automatic Control Valves** — These operate by introducing or exhausting water above a diaphragm that opens and closes the valve at a controlled rate. They can be used to control pressure downstream of the valve (pressure reducing), upstream of the valve (pressure sustaining) or both. The configuration of these valves makes them unsuitable for applications with any solids content and they are often used to regulate pressure in water distribution systems. ♦

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*Jason Hackbarth is an Application Engineer with Mueller.*





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# EXPANDING RESOURCES

NASSCO is working to expand its library of technical resources for the trenchless industry

By Sheila Joy

NASSCO’s fiscal year begins this month, but our ongoing objectives remain the same:

1. Grow NASSCO’s training and education programs
2. Expand NASSCO’s library of technical resources
3. Advocate for the underground infrastructure industry

NASSCO’s mission is to set standards for the assessment, maintenance and rehabilitation of underground infrastructure and to assure the continued acceptance and growth of trenchless technologies. Our vision — to build awareness of aging underground infrastructure and to provide viable solutions through education, technical resources and industry advocacy — is the foundation for NASSCO’s ongoing objectives.

Last month we shared our 2023 accomplishments to achieve Goal No. 1 ; this month we will focus on Goal No. 2: Expand NASSCO’s library of technical resources.

Under the strong leadership of NASSCO’s esteemed Technical Advisory Council, NASSCO committees developed and published a variety of technical resources, always free to the industry, including industry-wide webinars.

In 2023 NASSCO hosted a webinar on the topic of “Styrene and C.I.P.P. — What does it mean to the industry?” Co-panelists included representatives from the American Composite Manufacturers Association, the National Institute for Occupational Safety and Health, the Styrene Information and Research Center, the Trenchless Technology Center at Louisiana Tech and the University of Waterloo. NASSCO also partnered with representatives from the EPA on the topic of the Build America, Buy America mandate. This webinar attracted more than 1,000 registrants. NASSCO committees hosted additional webinars including the Pressure Pipe Committee’s webinar on Force Main Assessment, and the International Business Committee’s many webinars — in Spanish — on topics important to our industry.

NASSCO committees also developed and published a number of performance specification guidelines for the proper assessment, maintenance and rehabilitation of underground infrastructure, and continue to build the video library on various trenchless technologies.

A special workgroup on the topic of automated defect recognition — or ADR — has been busy reviewing videos to determine image quality at different camera speeds, as well as developing articles and educational materials regarding NASSCO’s position on this exciting new technology.

To better support our non-English speaking members and students, NASSCO’s International Business Committee also translated NASSCO’s website to Spanish, with French, Portuguese and other languages planned for the future.

With the recent hiring of NASSCO’s director of Health, Safety, and Environmental, safety podcasts are now available online, with additional safety talks and resources planned for members to share with their crews and other employees. NASSCO’s director of Health, Safety and Environmental is also available to provide safety audits, training and other services to member companies at a deeply discounted rate.

To download NASSCO resources, learn more about membership, watch pre-recorded webinars, and so much more, please visit [nassco.org](http://nassco.org). ♦

## Get the EDGE

### Training and Continuing Education Courses

#### PACP Training

July 8, 8 a.m. EST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

July 9, 8 a.m. MST

Virtual

Includes PACP, LACP, MACP

Trainer: Jerry Weimer

July 23, 8 a.m. MST

Phoenix

Includes PACP, LACP, MACP

Trainer: Jerry Weimer

July 24, 8 a.m. PST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

July 29, 8 a.m. EST

Virtual

Includes PACP, LACP, MACP

Trainer: Michael Lukas

July 31, 8 a.m. EST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

August 7, 8 a.m. EST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

August 14, 8 a.m. EST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

August 20, 8 a.m. MST

Denver

Includes PACP, LACP, MACP

Trainer: Jerry Weimer

August 28, 8 a.m. CST

Virtual

Includes PACP, LACP, MACP

Trainer: Brandon Conley

#### ITCP Training

July 16, 8 a.m. EST

Virtual

Includes ITCP-CIPP

Trainer: Michael Lukas

July 25, 8 a.m. EST

Virtual

Includes ITCP-CIPP

Trainer: John Williamson

August 15, 8 a.m. EST

Virtual

Includes ITCP-CIPP

Trainer: Lou Krch

August 20, 8 a.m. EST

Virtual

Includes ITCP-CIPP

Trainer: John Williamson

August 20, 8 a.m. MST

Helena, Montana

Includes ITCP-CIPP

Trainer: Rocky Capehart

August 22, 8 a.m. MST

Helena, Montana

Includes ITCP-MR

Trainer: Rocky Capehart

August 27, 8 a.m. MST

Helena, Montana

Includes ITCP-MR

Trainer: Tim Back

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Contact one of the trainers listed above if you are interested in having a class at your facility or in your area.

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# CHEMICAL AND MECHANICAL ROOT CONTROL

## Cable Machines

### Duracable DM175

The **DM175** upright machine from **Duracable** is ideal for clearing a sewer line that's been infiltrated by tough tree roots. With the versatility to clear obstructions from 3- to 10-inch lines, it is suitable for municipal, commercial and residential work. The 3/4 hp 175 RPM motor and 10-1 gearbox provides the torque needed to tackle heavy roots. A power cable feed and return on this machine makes it easy to use. It comes standard with 100 feet of 1 1/16-inch hollow core cable in a 23-inch reel, but you can switch to 3/4-inch cable when needed. An extensive lineup of tough, heat-treated and coated blades is available. **800-247-4081; www.duracable.com**



### Electric Eel Model C

The **Model C** dual-cable sectional drain cleaner from **Electric Eel** runs up to 200 feet of 1 1/4-inch, self-feeding dual cable in 8- or 10-foot sections that require no handling when rotating. It spins cable at twice the revolutions per minute of a continuous cable machine for cleaning 3- to 10-inch lines for distances up to 200 feet. One-person operation means less time and labor expense. A heavy-duty, 1/2 hp motor comes standard, and 3/4 and 1 hp motors are also available. A custom-designed gearbox ensures higher quality, lower cost and parts availability. The heavy-duty, fully adjustable safety clutch keeps cable and tool breakage to a minimum and provides overload protection. A fold-down handle allows for easy transport, storage and use in crawl spaces. Its carry handle allows for balance and easy transport. **800-833-1212; www.electriceel.com**



### RIDGID K-4310 FXP Drum Machine

The **K-4310 FXP Drum Machine** is RIDGID's most powerful drum machine, featuring a cable counter that provides real-time, in-pipe cable distance for faster locating and diagnostics. Ideal for residential and commercial plumbing and drain cleaning projects, its powerful brushless DC motor spins at 230 rpm and provides long-lasting run-time with less required maintenance. Clearing 3- to 10-inch lines, it is powered by the FXP Technology Platform, which provides cordless freedom and powerful performance. The cable distance tracking feature allows professionals to always know where their equipment is located within the line, simplifying cleaning. The enclosed quick-change drum is easily removed, allowing for easier setup and transport, while the rotating inner drum efficiently dispenses cable and reduces the chance of cable flip over. Integrated AUTOFEED Technology advances and retrieves cable up to 28 feet per minute with zero tools. **800-769-7743; www.ridgid.com**



## Cutting Nozzles

### Arthur Products Cnt-r-KUT ELITE max

The **Cnt-r-KUT ELITE** max kit from **Arthur Products** is a complete rotating nozzle pipe cleaning system. Manufactured from high-grade stainless steel and an aerospace elastomer, it is designed to clean pipe using a rotating head, which can be equipped with linked chain, roller chain, cable or just water jets. Three flexible lightweight centering guides of 3-, 4- and 6-inch diameters can be quickly changed in the field to stabilize and center the rotating head, yielding 360-degree internal cleaning. An optional deicing/degreasing head further enhances its capabilities. **800-322-0510; www.arthurproducts.com**



### Enz USA 10.125TR Turbine

With operating flows as low as 13 gpm at 2,000 psi, the **Enz USA 10.125TR Turbine** nozzle is a powerful cleaning tool. The turbine design allows for lower flow and less water usage while still maintaining high torque for effective pipe cleaning in lines ranging from 5 to 12 inches. Because of its sealed bearings, this nozzle can be operated with both clean and recycled water while being relatively maintenance-free. This compact, efficient nozzle is a powerful root remover and conquers grease, solids, mineral deposits, concrete and grout. Its complete kit offers a selection of pre-cut chains, skids and two head styles to competently clean pipes efficiently. **877-369-8721; www.enz.com**



### Hydra-Flex Revolution

The **Revolution** sewer jetting nozzle from **Hydra-Flex** offers a triple-threat attack in 6- to 36-inch pipes. Its tip creates a 0-degree, straight-water stream that rotates at a 30-degree cone of coverage to powerfully break through roots, grease and tough blockages. The 10-degree back jets offer a smooth ride for the nozzle to glide with ease through the pipe as the front bursts out water at a pressure range of 1,000 to 2,500 psi. The last attack is the 360-degree rotating sub-head, which works to completely clean and descale pipe walls. The sub-head speed remains consistent and controlled throughout the duration of its life to always output maximum power. A stainless steel housing and tungsten carbide wear surfaces make it extremely durable and capable of withstanding harsh environments. **952-808-3640; www.hydraflexinc.com**



### Root Rat cutting nozzle

**Root Rat** cutting nozzles are used with jetters from 11 hp to large truck-mounted models. The cutters are made of hardened stainless steel and come with a toolbox with two interchangeable rotors — one with cables and the other with chains. The com-



bination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes for under \$10 in parts. **800-288-7873; www.rootrat.net**

## Jetters

### American Jetter 58 Series Inferno Burner Hot Jetter

The **58 Series Inferno Burner Hot Jetter** from **American Jetter** offers up to 67% more efficient heat over traditional burners, according to the maker. This fuel-saving hot water system provides power for grease cutting and deicing, utilizing a 38 hp EFI Kohler gasoline engine with flows up to 20 gpm and pressure to 5,000 psi. The rear speed control reel provides precise cleaning speeds and easy access to the jet hose with the included hose guide. Low-water shut-off stops the engine if the 220-gallon tank runs low. The optional 1-mile open range wireless remote option features water ON/OFF, engine shutdown and hose reel control. The heavy-duty square tubing trailer has a 2-inch ball coupler and standard electric brakes. **866-944-3569; www.americanjetter.com**



### Cam Spray RCJ Series

**RCJ Series** skid-mounted jetters from **Cam Spray** are offered in flows and pressures of 8 gpm at 3,500 psi and 7 gpm at 4,000 psi. A three-plunger industrial pump with pulse is powered by a 688 cc Honda engine. Its 200 feet of jetter hose can be used to supply an optional 200DS4 portable reel cart with 200 feet of 3/8-inch jet hose. It comes with a 35-gallon buffer water tank with float control, powder-coated heavy tube frame, washdown gun and a four-nozzle set. It easily mounts in the side door of a cargo van, on a truck bed or inside a service truck. **800-648-5011; www.camspray.com**



### GapVax G7 Jetter

The **G7 Jetter** from **GapVax** is built on a heavy-duty, contractor-grade NATM-certified trailer. Several engine choices, including Cummins diesel, are certified and sized appropriately for the water pump combinations. The unit's hose reel is hydraulically powered with a direct-drive gearbox and variable-speed control. The hose reel offers a 3-foot (curbside) articulation from center of bearing, 180-degree rotation and a capacity of 800 feet of 3/4-inch jetter hose. The polyethylene plastic water tank is available in 300, 500, 600 or 700 gallons. The water pump is center-fed for optimum performance. The controller is interlocked with safety features that will show low fuel levels and low water, and is capable of a complete engine shutdown in an emergency. **888-442-7829; www.gapvax.com**



### General Pipe Cleaners JM-1000 Mini-Jet

The combination of **General Pipe Cleaners'** portable **JM-1000 Mini-Jet** and high-performance stainless steel braid jet hose offers drain cleaning power in a small package. The jetter is available with stainless steel braid hoses with Teflon core in a variety of lengths. The durable hose also works well with the JM-1450 electric



jet. It can be used to clear grease, sand and ice from small lines, sinks and laundry drains with high-pressure, wall-to-wall water spray. It packs 1,500 psi of cleaning power in a compact package, yet weighs only 23 pounds. Its rugged diamond-plate metal case safely shields the pump and motor assembly from common job site abuse. The stainless steel braid hose design smoothly slides the jet nozzle down 1 1/2- to 3-inch drainlines and more easily navigates tight bends. The 3/16-inch Teflon core also reduces flow resistance, further improving small-line cleaning power. **800-245-6200; www.drainbrain.com**

### HotJet USA turbo diesel trailer jetter

**HotJet USA** is offering a turbo diesel-powered trailer jetter powered by Yanmar. It features 59 hp of power with true 20 gpm at 4,000 psi output in a compact, affordable package, offering 10% more power than regular 18 gpm units. Yanmar-powered units are Tier 4 compliant, are fuel-efficient and use an XL Radiator. The engines are water cooled for maximum efficiency and are easily maintained by a network of service centers nationwide. The jetters may be mounted on 5-by-12 to 5-by-16-foot decks with a choice of single or tandem axle. They are available in cold or hot/cold operation and will clean drainlines up to 24 inches. **800-624-8186; www.hotjetusa.com**



### Jetters Northwest EAGLE 4020

The powerful 20 gpm, 4,000 psi **EAGLE 4020** trailer-mounted jetter from **Jetters Northwest** can power proven root-cutting nozzles like the Warthog, Bulldog and Reaper. It is especially suitable for spot work at locations that require several return visits during the year. Powered by an emissions-friendly Kawasaki fuel-injected/liquid-cooled engine, it is built on industrial-duty trailers with brakes for safety and can be towed with a full water tank. Choose between two sizes — the two-axle Eagle-600 (gallon) or one-axle Eagle-300 (gallon). With up to 600 feet of jet hose, the 12-volt powered hose reel sits on a swiveling base and operates even if the jetter runs out of fuel. A wireless remote offers safe control of jetting on/off, engine on/off, throttle/pressure up/down, and reel-wind, plus local/manual controls are mounted on the swiveling hose reel. Twin fender-mounted tool bins allow for significant storage-space and aluminum wheels provide a sharp appearance. Pulsation control helps the jet nozzle pull through long runs. Four nozzles are provided, and with root/grease nozzles optional. **877-901-1936 www.jettersnorthwest.com**



### Mongoose Jetters by Sewer Equipment Model 184

The **Mongoose Jetters** by **Sewer Equipment Model 184** comes with a run-dry pump offering 18 gpm at 4,000 psi, a tubular steel frame, corrosion-resistant prepainted subassemblies, state-of-the-art controls, strong hose reel and high-quality gas engine. It is suitable for drain cleaning and sewer jetting, remote access locations, mainlines up to 12 inches in diameter and commercial and industrial lines. The trailer unit comes with a water tank capacity of 300 gallons and standard hose reel capacity of 600 feet of 1/2-inch hose. The trailer setup consists of a 6,000-pound-rated single-axle trailer, and the addition of a wireless remote control system makes this equipment a true one-person operation. It is also available as a van pack or truck-mounted unit. **815-835-5566; www.sewerequipment.com**



(continued)

## MyTana MV84

The **MV84** jetter from **MyTana** efficiently cleans and clears 3- to 10-inch lines. It has a robust 800 cc Honda engine that lets the super-duty triplex pump deliver 8 gpm at 4,000 psi. With a dual-cart design and remote throttle control, it lets you jet indoors or access hard-to-reach cleanouts. The jetter cart houses the engine, super-duty triplex pump and supply buffer tank. A separate hose cart is connected with a 50-foot jumper hose and has ball valve flow control. It comes fully equipped with 250 feet of 3/8-inch jetter hose. Attach a specialty nozzle and take on roots. It is easy to load, maneuver, maintain and use. **800-328-8170; www.mytana.com**



## Spartan Tool Warrior

With fiberglass casing to protect and silence the entire machine, **Spartan Tool's Warrior** trailer jetter provides 4,000 psi at 18 gpm to clear almost any line, according to the manufacturer. The 180-degree pivoting hose reel and optional four-function remote control allow technicians to handle the tightest spots. With pulsation and a full antifreeze system, it is designed to remove tough clogs in any weather. Its design includes room to customize it with a company logo and colors, and it provides a 300-gallon towing capacity. **800-435-3866; www.spartantool.com**



## Super Products SuperJet

The **SuperJet** truck-mounted jetter from **Super Products** is used to blast debris to clear blockages and maintain sewer lines when vacuuming extraction is not required. It uses a strong and smooth single-piston water pump to create consistently high water pressure. Units come standard with rotationally molded polyethylene water tanks in a modular design to accommodate water capacities ranging from 1,080 to 3,240 gallons. They offer standard curbside and street-side fill. The hose reel has 1,000 feet of 1-inch-diameter sewer hose, 200-degree rotation and a digital monitor. This allows operators to work efficiently while positioned out of traffic and away from other hazards. The monitor displays a hose footage count, offers 20 saved settings for hose reel payout, and is designed with LED panel lights to enable readability in a variety of environments. **800-837-9711; www.superproducts.com**



## Trojan Worldwide TWW3000D Diesel Trailer Jet

The **TWW3000D Diesel Trailer Jet** from **Trojan Worldwide** comes mounted on a tandem-axle trailer with a steel diamond plate deck and braking system. The power unit consists of a diamond-plate enclosed 60 hp Perkins diesel engine with a PTO-style transmission and an AR water pump pushing 22 gpm at 3,000 psi. The rear of the unit includes a hydraulic hose reel with 500 feet of 3/4-inch hose and includes a speed control for the forward/reverse function. Water is supplied by a 525-gallon tank that is fed from a 100-foot fill hose or the included hydrant fill application. The open trailer layout makes accessing all of the components easier and less time-consuming. **800-392-4902; www.trojanworldwide.com**



## Vac-Con VJ Series

The **VJ Series** of jetters from **Vac-Con** is designed to provide operators with an economical, portable and powerful system in two configurations. The VJ375 offers a 375-gallon water



capacity on a single-axle trailer. The VJ750 boasts 750-gallon water capacity on a tandem-axle trailer. Standard features include Tier 4 diesel engine, cold-weather recirculation and air purge system, hydraulically driven hose reel and a reel-mounted, weatherproof electronic control panel. Units are available in multiple water pump pressure and flow configurations. Optional features include gas engine, wireless remote and an antifreeze tank system for cold-weather use.

**904-284-4200; www.vac-con.com**

## Vector Ramjet

The **Ramjet** from **Vector** provides greater precision, increased storage options and superior cold weather protection, making jobs safer, easier and more efficient for the operator. IntuiTouch controls provide greater precision and enhanced productivity. Improved water plumbing adds even more storage options. It includes an IntuiTouch control system with one-touch activation, low-maintenance Jet Rodder water pump, Park-N-Clean technology for faster setup at the job site, a Modul-Flex design for maximum capacities and optimum weight distribution, a stainless steel water tank that offers greater strength and corrosion protection, and superior cold weather operation that includes separate storage for wet and dry items.

**815-672-3171; www.vector.com**



## Mechanical Root Cutters

### SewerProShop Blue Star Raptor and Viper

**Blue Star Raptor** and **Viper** chain cutters from **SewerProShop** are made of high-grade stainless steel and are furnished with ceramic nozzle inserts. With the Raptor, choose from 4- and 6-inch rigid skids or a 6- to 12-inch flexible guide skid, along with cutting chains and carbide bits to achieve quick solutions. Viper chain cutters are designed to remove heavy obstructions caused not only by roots but also grease, mineral deposits and other solid organic material. The unit is driven by a high-performance turbine, which doesn't require any lubrication. Chains spin at speeds of 4,000 to 12,000 rpm. Multiple guide skids available in various sizes provide a service range of 4 to 48 inches. The Viper can be operated with recycled water. Chain root cutters are free from lubrication, low maintenance and have continuously adjustable guide skids for various pipe diameters and different obstructions.

**404-918-9572; www.sewerproshop.com**



### Shamrock Nozzles by Triton HydroTools Contractor Duty Root Saw

The **Contractor Duty Root Saw** from **Shamrock Nozzles** by Triton HydroTools is an improved version of the classic internally-ported, heavy-duty hydraulic power unit. This upgraded version includes ceramic coated internal wear surfaces. This coating extends the service life of the motor and helps prevent corrosion that can degrade performance over time. This high-performance unit operates at 2,250 ft-lbs of torque in order to prevent stalling, and provides a blade rotation speed of 300 to 350 rpm for extended tooth life. This is a versatile tool that can be outfitted with circular saw blades, spring blades or cable rooters. It cleans pipes 6 to 18 inches in diameter and is available for 3/4-, 1- and 1 1/4-inch hose sizes. The motor operates on jetters capable of at least 50 gpm. Kits are available that provide skids and blades that can be changed to operate the root saw in multiple pipe sizes.

**800-633-7696; www.shamrocktools.com**





# PRODUCT FOCUS

## USB-USA Turbo Chain Cutters

Heavy-duty **Turbo Chain Cutters** from **USB-USA** are tough and powerful. These cutters continuously adjust from 8- to 15-inch (Turbo S200) or 12- to 24-inch (Turbo S600) and easily fit into the pipe. Turbine technology powers the durable chain retainer on a robust body to remove roots, concrete, calcium deposits, hardened grease and tuberculation from sewer lines. They are designed to be very aggressive for the hardest materials. The beefed-up, heavy-duty cutters have double the amount of turbine driving water jets as the company's other cutters, generating tremendous cutting power. Easily adjust the cutter to within 1/16 inch by spinning the rear to make it larger or smaller. Internal 3D fluid mechanics in conjunction with one-piece ceramic nozzle inserts allow the cutter to be used with recycled or clean water. **844-285-5770; www.usb-usa.com**



## Root Chemicals/Application

### Milwaukee Tool M12 1 and 2 Gallon Handheld Sprayers

**Milwaukee Tool's M12 1 and 2 Gallon Handheld Sprayers** are designed to meet the performance, control, and ergonomic needs of the professional user. This handheld sprayer provides the pressure control without any manual pumping, allowing the user to easily optimize the performance for multiple applications. Providing instant, constant and adjustable pressure, the sprayer has three modes to adjust between 20 and 80 psi, and reaches up to a 17-foot vertical spray distance. Users can expect up to 80 gallons of spraying per charge to offer more efficiency and maximum runtime. The powerhead is compatible with both 1- and 2-gallon handheld sprayer tanks, allowing users to optimize the tank capacity to the application and premix multiple tanks to increase productivity. The sprayer also features an onboard measuring cup, a strainer that filters debris from entering the tank, and vertical and horizontal wand storage. **800-729-3878; www.milwaukeetool.com**



### Oatey Hercules R-D Root Destroyer

**Hercules R-D Root Destroyer** from **Oatey** is a slow-dissolving, nonacidic, noncaustic herbicide formulated to eliminate and prevent root growth in sewer lines. By preventing sump and ejector pump root damage, it eliminates overflow damage, sewage flow restriction and backup odors. It is safe to use in lines leading to septic tanks, cesspools and dry wells, and is harmless to the environment. **800-321-9532; www.oatey.com**



### RootX

The **RootX** formula foams on contact with water, which places the active root killing ingredient on the top of the pipe where 90% of root growth occurs. Once on the roots and pipe walls, it eliminates blockages caused by live roots for up to 12 months requiring annual treatments. The company supports annual treatments by sending reminder letters to the service provider's customers to contact them for another treatment. **800-844-4974; www.rootx.com**



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 Honda Engine

**30 GALLON TANK \$8539 Plus Freight**

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**4008H POWER UNIT**

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»12 gpm @ 3000 psi »400' x 1/2" Jet Hose  
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 »800 cc EFI on DC Powered Reel  
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**4008H COMPACT SKID**

»8.2 gpm @ 4000 psi »400' x 3/8" Jet Hose  
 »800 cc EFI on DC Powered Reel  
 Honda Engine

**(100 GALLON TANK) \$14,129 Plus Freight**

**VM4008H**

»8.2 gpm @ 4000 psi  
 »690 cc Honda Engine  
 »50' x 3/8" Washdown Hose on DC Reel

**\$13,399 Plus Freight**

**STB3012H**

»12 gpm @ 3000 psi  
 »800 cc Honda Engine  
 »400' x 1/2" Jet Hose on DC Reel

**\$22,899 Plus Freight**

**STB4008H**

»8.2 gpm @ 4000 psi  
 »690 cc Honda Engine  
 »50' x 3/8" Washdown Hose on DC Reel

**\$22,299 Plus Freight**

All Jets Shown Come with Pulse Valve, 2 Jet Nozzles, Tool Box, Gloves, Safety Glasses, Tip Cleaner, Tiger Tail, Wash Down Trigger Gun with Nozzles.

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# Product Spotlight

Pump station offers ease of operation and safety benefits

By Craig Mandli

An aboveground pump station can offer a municipality several advantages in terms of accessibility and maintenance. With all mechanical and electrical equipment above ground, monitoring and performing routine maintenance without requiring specialized equipment and safety procedures is easy. Plus with the pump station located aboveground, one operator can now safely access and maintain all the equipment at the station without the need for cranes, crane trucks and hazardous confined space entry and the emergency safety procedures that accompany that work.

Smith & Loveless offers the EVERLAST Series 4000 Pump Station designed to provide municipalities with high efficiency, a long service life, operator ease and safety, and low operation and maintenance costs. The unit comes as a complete, factory-built and tested system that is fast and simple to install in both new installations and replacements of submersible pumps. This state-of-the-art packaged pump station incorporates premium efficiency motors designed for wastewater, resulting in reduced energy consumption costs and a smaller carbon footprint.

Unlike submersible pump stations, all mechanical equipment is safely located and easily accessible above ground and outside the wet well, eliminating confined-space hazards during routine maintenance and operation. Moreover, the Series 4000 features a two-piece split, rolling UV-coated fiberglass enclosure



that provides easy 360-degree access to all components.

According to Smith & Loveless, the cost savings for maintenance and operation is a major benefit. For example, a Kansas municipality conducted a study of the repair and maintenance costs of 32 Smith & Loveless aboveground pump stations compared to 21 submersible pump stations in the same sewerage network over a period of 12 years. The results showed that the aboveground stations had nearly 56% lower operating expenses, resulting in maintenance and parts savings of \$2,750 per station per year.

The Series 4000 pump station is equipped with STAR ONE Non-Clog Pumps, which are centrifugal solids-handling pumps that are designed for a long service life. These pumps also offer high efficiencies across the range of pumping conditions typically found in municipal pumping applications.

All stations are outfitted with QUICKSMART PLC controls, which provide a touchscreen for simplified training and operation. Optional RapidJack check valves eliminate the need for time-consuming valve disassembly and interim piping realignment and are easily accessed by removing just four bolts. Another popular option is the DURO-LAST 316/Lean Duplex Series 2100 stainless steel baseplate. **800-898-9122; www.smithandloveless.com**

**SPECIAL REPORT**

## OZ Lifting davit crane wheel base



OZ Lifting Products' wheel base revolutionizes lifting operations by effortlessly transporting and positioning a davit crane (up to 1,200 pounds) across diverse environments. Featuring industrial-strength steel construction and powder coat finish, the versatile base tackles tough jobs with ease. Durable polyurethane-tread indoor/outdoor wheels with rear swivel casters ensure

smooth mobility. Rear casters feature lock brakes for enhanced safety and stability, and a patent-pending floor-anchoring system allows the davit to rotate under load with 360-degree rotation. Made in the USA and fully adjustable from 56.57 to 77.57 inches long, 32.44 inches wide and 36.87 inches high, OZ's wheel base helps unlock the full potential of your davit crane. **800-749-1064; www.ozliftingproducts.com**

## Subsite UtiliGuard 2 RTK receiver

Subsite launched its new UtiliGuard 2 RTK (real-time kinematic) receiver. Designed with survey-grade technology and dual-band antennae, the receiver delivers centimeter-grade accuracy, making it an ideal solution for locating abandoned and untracked utilities that are often difficult to pinpoint. Its high-precision capabilities provide valuable insights into underground infrastructure, helping crews avoid cross bores during future projects. Like the UtiliGuard 2 Standard and Advanced units, the RTK receiver features integrated data capture, GPS positioning and an intuitive user interface to improve work quality and maximize locate awareness. Additional enhancements include dead-reckoning capabilities, which help operators maintain accurate locates in heavy tree canopy or areas where GPS signals falter. A multi-frequency fault-finding capability also allows contractors to accurately identify and locate faulted power lines using a broad spectrum of customizable frequencies, up to 10 kHz. **800-846-2713; www.subsite.com**



## PRODUCT NEWS

### Bristol Instruments Dinel DLS-35 Series level sensors

The Dinel DLS-35 Series of capacitive level sensors from Bristol Instruments are designed for use with liquids and bulk solids. Limits are set easily with a magnetic pen. A quick-set mode lets users perform setup without the presence of a medium. DLS-35 level sensors can be directly mounted to tanks, vessels, sumps, tubes, silos and hoppers. Bar, rod and rope electrode options collectively cover electrode lengths from 2 inches to 19.7 feet over five range options. Two LED indicators show operation status and provide visual confirmation of settings. Signal output options are NPN, PNP or NAMUR (change in supply current). Housing and electrodes are available in either 304 or 316L stainless steel. G3/4, G1, M27 and M30 threaded and C134 and C150 Tri-clamp process connections are available. 877-866-8500; [www.bristol-inst.com](http://www.bristol-inst.com) ◆



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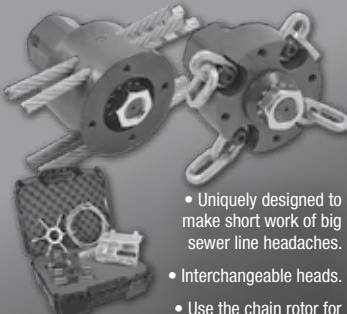
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## PEOPLE/AWARDS

**Brandon Blanchard** was promoted to vice president of the environmental division for **Pare Corporation (Rhode Island)**. Among his responsibilities are stormwater management projects in conjunction with municipalities and other entities.

The **city of Jacksonville** will receive up to \$400,000 from the state of North Carolina to develop a watershed action plan, which will analyze the impacts of stormwater on a watershed scale to minimize the impacts of stormwater on the New River.

The **city of Tampa (Florida)** received \$959,000 via a federal infrastructure grant for a flood relief project that will replace and upgrade a stormwater drainage system in South Tampa.

The **city of Roseau (Minnesota)** received a \$2.4 million U.S. Economic Development Administration grant to construct new stormwater infrastructure that will prevent flooding near local businesses during heavy rain events.

The **city of Middletown (Ohio)** received a \$300,000 grant from the Ohio Department of Natural Resources for projects that will, in part, reduce stormwater runoff.

The **city of Indian Wells (California)** received a \$5 million federal grant for the Whitewater Channel Lining Project that aims to enhance flood protection.

The **city of Kalamazoo (Michigan)** received a \$38 million federal grant. The Building Resilience in Kalamazoo's Downtown Transportation Network project is designed to enhance stormwater infrastructure and lower flood risks. ♦

## CALENDAR

### August 11-15

International Water Association World Water Congress & Exhibition, Metro Toronto Convention Centre, Toronto, Ontario, Canada. Visit [worldwatercongress.org](http://worldwatercongress.org).

### August 27-29

StormCon 2024, Grand Sierra Resort and Casino, Reno, Nevada. Visit [stormcon.com](http://stormcon.com).

### October 5-9

Water Environment Federation Technical Exhibition and Conference, Morial Convention Center, New Orleans. Visit [weftec.org](http://weftec.org).

### October 9-11

Southeast Stormwater Association Annual Conference, site TBA, Chattanooga, Tennessee. Visit [seswa.org](http://seswa.org).

### October 21-23

California Stormwater Quality Association Annual Conference, SAFE Credit Union Convention Center, Sacramento, California. Visit [casqa.org](http://casqa.org).

### October 22-24

Tennessee Stormwater Association Annual Conference, Montgomery Bell State Park, Burns, Tennessee. Visit [tnstormwater.org](http://tnstormwater.org).

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### Avanti becomes minority owner of US Grout

For more than 20 years, Idaho-based US Grout and Texas-based Avanti International have partnered to deliver Ultrafine cementitious grouts — a permanent, deep-penetrating, densely curing cementitious grout for sealing fractures in rock, controlling ground water and stabilizing weak soils. The companies have now formalized their long-standing partnership. US Grout was formed in 1998 with the primary purpose of producing a grout for sealing microfractures within the underground nuclear Waste Isolation Pilot Plant in Eunice, New Mexico. In the fall of that same year, US Grout and Avanti joined forces for the distribution of this specialized grout into other markets.

### Kamstrup Water Metering opens new headquarters in Georgia

Kamstrup Water Metering opened its new North American headquarters and manufacturing facility in Forsyth County, Georgia. Based in Denmark with employees in over 20 countries, Kamstrup supplies intelligent metering solutions and services, working to reduce waste and optimize the production and distribution of clean water and energy. Kamstrup began operating in the United States in 2013. With the new Georgia facility, Kamstrup has grown its North American operations and manufacturing capacity, expanding into a 150,000-square-foot space at Forsyth Commerce Center in Cumming.

### Xylem, UNICEF partner to deliver water solutions in Africa

The Horn of Africa is experiencing extreme weather conditions worsened by climate change, including heavy flooding and a devastating drought that impacted

nearly 37 million people. To meet urgent water and sanitation needs, UNICEF and Xylem are partnering to deliver solutions to severely affected communities in Ethiopia, Somalia, Sudan and Uganda. Through Xylem Watermark, the company’s corporate social responsibility program, Xylem colleagues will share technical expertise with UNICEF’s specialists in the region, collaborating to identify new solutions and innovations focused on climate-resilient approaches and technologies. Such approaches include solarization of borehole pumping, non-revenue water prevention and aquifer recharge. Local utility staff will receive hands-on training and up-skilling, and UNICEF will support utilities in the areas of finance and governance.

### Franklin Electric announces 2023 recipients for outstanding achievement

Franklin Electric recognized several employees for their outstanding achievements towards business goals and customer satisfaction in 2023. The company presented the awards at their annual Commercial Summit, a multi-day event dedicated to strategic planning and continuing education. The winners of this year’s awards for outstanding performance, sales and support were U.S./Canada Salesperson of the Year Dan Hilgendorf; U.S./Canada Field Service Engineer of the Year Eric Aleksich; and U.S./Canada Team of the Year, Industrial Distribution.

### MentorAPM welcomes two senior sales executives

MentorAPM ushered in the second quarter with the addition of two senior sales executives to oversee its primary customer groups. Ken Madsen is responsible for industrial business development and David Stadelmann covers the municipal market. Faced with similar challenges, such as aging infrastructure and tightening regulations, Madsen and Stadelmann share a passion for helping customers solve problems with software and SaaS technology solutions, and bring more than 50 years of combined experience. ♦



**Dave Stadelmann**



**Ken Madsen**



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