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MODERN MINUTEMEN

George Brackett
Senior Water Technician
Groton, Massachusetts

Small Massachusetts water utility's progressive approach to new technology improves efficiency

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ON THE COVER: Groton (Massachusetts) senior water technician George Brackett checks the new SCADA control panel at the Whitney Pond Wells pump station. The system gathers information in real time and sends it to the department's Baddacook Pond Treatment Facility. (Photography by Noah Willman)



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


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Luke Laggis

YOUR WORK IS ESSENTIAL

Serving you and helping you operate your water and wastewater systems is a privilege

I wrote my column for the May issue of *Municipal Sewer & Water* in early March. That seems impossibly long ago.

I waited until the last minute to write this June column because everything was changing by the day. After several weeks with much of the population sheltering in place, things are starting to open back up, but many restrictions remain in effect. It's incredible that it's only been a few months since all this started.

Early on in its pandemic response, the federal government identified you as essential critical infrastructure workers. At COLE Publishing, we've always known you're essential. That's why we're here.

We're working from home now and a few things have changed, but

we're still mostly putting the magazine together as we always have. You will, however, notice some little changes over the next few months. With the shutdowns, some stories and photos have been harder to get. As a result, our utility profiles will rely more on contributed photos. Starting next month, you'll also notice that we're sharing some of our top stories from the past 10 years. It's a good time to review and reflect, and we feel these stories are worth revisiting. They all rank at or near the top in page views at MSWmag.com over the past decade.

“At COLE Publishing, we’ve always known you’re essential.”

I feel privileged to share your stories, old and new. Operating water and wastewater systems is a commitment that goes way beyond the standard workday. You're not just earning a paycheck; you're taking care of your community, and that's never been more evident.

Clean water is essential to life, and proper sanitation is one of the greatest factors in public health. Ensuring we have both is a monumental task that rarely gets the respect it deserves. We take it for granted until suddenly there's a problem. Most often it's a water main break that leads to a temporary loss of service or a clogged sewer line backing wastewater up into our basements. Maybe the occasional boil-water advisory or a frozen line. But those are all short term. We act inconvenienced, but only because we're used to such incredible convenience.

A lot of people were taking a lot of things for granted before this pandemic began shutting down our normal lives. And then suddenly hand sanitizer vanished from shelves. Then toilet paper. And then businesses closed. But our water and wastewater systems kept working as they should, because you stayed on the job.

You still won't get the appreciation you deserve in most cases, but that's absolutely not the case here. We, the entire staff at COLE Publishing, know your role is just as important as any doctor, police officer or elected official. You are unsung heroes, and we are here to say, “Thank you.”

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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FUEL USAGE

Keeping Tabs

Fuel is one of the greatest operating costs for any utility that owns heavy equipment and/or trucks. Working in a way that saves fuel can save a lot of money. In this online exclusive article, William Bernhard, technical and safety services manager for the Association of Equipment Manufacturers, talks about some of the best ways to save fuel. mswmag.com/featured



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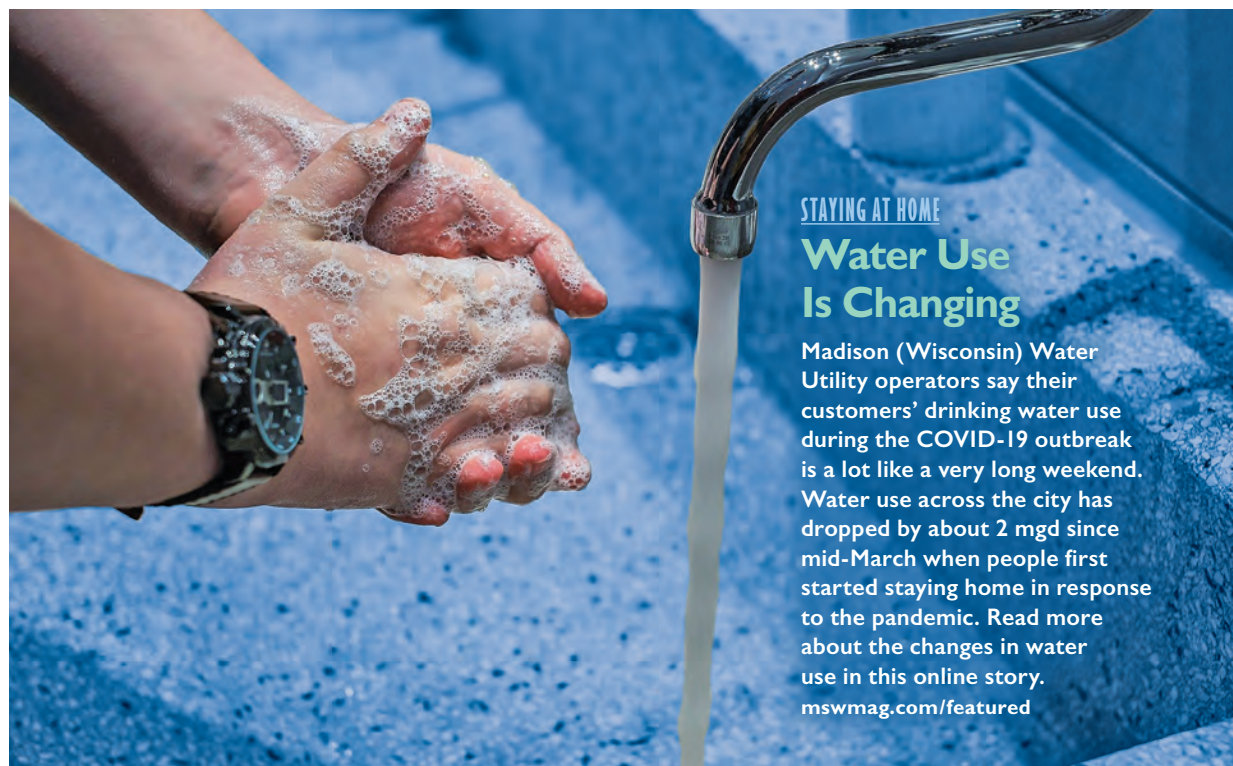
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OVERHEARD ONLINE

“We don't design buildings to be shut down for months. Part of what we're trying to do is put energy toward helping others develop guidelines so they can go in and start recovering their buildings.”

— Researchers Say *COVID-19 Building Closures Could Affect Water Quality*
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STAYING AT HOME

Water Use Is Changing

Madison (Wisconsin) Water Utility operators say their customers' drinking water use during the COVID-19 outbreak is a lot like a very long weekend. Water use across the city has dropped by about 2 mgd since mid-March when people first started staying home in response to the pandemic. Read more about the changes in water use in this online story. mswmag.com/featured

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MODERN MINUTEMEN

Small Massachusetts water utility's progressive approach to new technology improves efficiency

By Giles Lambertson



What the Groton Water Department accomplished in 2019 is impressive and indeed worthy of recognition by the Massachusetts Department of Environmental Protection.

The Boston suburb was recognized for optimizing two existing sources of water. But Groton's Whitney Pond Wells pump station optimization project did far more than keep the water flowing from town faucets.

The project transformed system management, produced a measurable boost in capacity and deferred the expenditure of millions of dollars. And it all happened because the town enhanced the usefulness of two of its existing wells.

Setting up

"The project involved a few different moving parts," says Thomas Orcutt, Groton water super-

intendent. That matter-of-fact summation understates the planning and execution involved. The project occurred because Orcutt and technicians in the Groton Water Department had used a previous state grant program to perform an energy audit. The information gleaned from that process readied the town for additional funding opportunities from the state.

"You could say we were well-positioned for the second round of grants," Orcutt says. "The Water Department has a very attentive operations staff who always strives to do things better and be more efficient. This improvement project was sort of on the back burner, awaiting funds from our reserve fund balance." The utility ultimately funded the project with a combination of grant money and low-interest loans.

"The Water Department has a very attentive operations staff who always strives to do things better and be more efficient."

Thomas Orcutt

The "moving parts" of the project included getting permission from the state Department of Environmental Protection to modify the pumping permit for the wells without increasing actual drawdown of the underground pool. The aim, after all, was to optimize the pumping process rather than augment it.

Since the older pumps and motors had been oversized in terms of what was permitted, Groton



The Groton (Massachusetts) Water Department's Baddacook Pond Treatment Facility was constructed in 1897. The community's history predates the Revolutionary War. (Photography by Noah Willman)



Groton Water Superintendent Tom Orcutt and senior water technician George Brackett stand next to the Sulzer pumps and GE Power motors retrofitted at the Whitney Pond Wells pump station.



PROFILE:
Groton
(Massachusetts)
Water Department

CUSTOMERS:
2,256 connections, 4,963 residents

SERVICE AREA:
13 square miles

WATER VOLUME:
0.42 to 0.60 mgd summer consumption

WATER TREATMENT PLANT:
Constructed 1897, completely updated 2005, capacity 250,000 gpd

INFRASTRUCTURE:
52.2 miles of potable water line

EMPLOYEES:
Superintendent, 1.5 office/clerical staff, 2 technicians

WEBSITE:
www.grotonma.gov

was able to install smaller Sulzer pumps and GE Power motors without any loss of capacity. The same amount of water is being pulled to the surface but more efficiently. Also, the new pumps are variable-speed units, giving department engineers more flexibility in operation. The two wells have a combined pumping capacity of about 1 mgd

The relative complexity of the new pumps started a cascade of other technological upgrades. Because the pumps required a more sophisticated control panel for operation, the department replaced two older panels, including one utilized since 1989. A SCADA panel was also installed to more closely monitor the rejuvenated pump stations. The SCADA panel transmits Whitney Pond data to a central pumping office for integration into overall well operations.

“It was truly a win-win for both utilities. They lower demand requirements for their generators, and we get a reduced rate.”

Thomas Orcutt

Chain reaction

A pump station upgrade may seem minor, but in this case, the payoff was considerable: a 40% increase in pumping capacity for meeting peak water demand in summer and deferral for at least five years of spending \$3 million for a new well. Groton water officials also lowered electricity costs. They wrangled a special deal with the town-

“We try to complete innovative projects that make the operations better and more efficient.”

Thomas Orcutt

owned electric company that trims \$8,000 from the department’s annual electricity bill.

“We worked with the general manager and commission to offer us a new lower electrical rate,” Orcutt says. “In return, we’ll turn off our pumps each month during periods of peak energy demand. It was truly a win-win for both utilities. They lower demand requirements for their generators, and we get a reduced rate.” When notified of a peak demand, Orcutt and colleagues rely on their SCADA system to make the necessary pumping adjustments. The town water system has a million-gallon storage tank.

In sum, water management in Groton was significantly changed and made more cost-efficient because a couple of pumps were upgraded. Not every Groton Water Department project is as impactful as this one, but there is a pattern. “We try to complete innovative projects that make the operations better and more efficient,” Orcutt says.

The department is currently phasing out its monthly manual meter-reading routine with a cellular-based automated system. The system delivers meter readings via two-way wireless electronic meters (Badger Meter) with ORION encoders. Besides reducing labor costs, the cell readings are real time so monitoring techs are



The new SCADA control panel at the Whitney Pond Wells pump station gathers information in real time and sends it to the Baddacook facility.

instantly aware of any leaks. Some \$50,000 has been budgeted for the replacement project in the current fiscal year.

Operational history

Groton is a town with an important history predating the Revolutionary War, and Orcutt is a 45-year veteran of the water and wastewater industry, working the past 22 years at the Groton Water Department. While Orcutt and the town’s leaders are clearly focused on the future, some of that history still comes into play.

The town of approximately 10,000 dates back to 1655. Minutemen assembled in a Groton town common to fight the British. Various Roosevelts attended Groton School, which opened its doors in 1884. Given all that history, it is no surprise the town has cast iron water distribution pipes



Groton also installed a new Eaton Freedom 2100 Motor Control Center in the Whitney Pond Wells pump station.

laid in 1897. “A great deal of this pipe remains in active use today with no structural or quality impediments to its operational ability,” Orcutt says. “There are plans to replace some pipe systems, but this is pending local funding.”

He adds that Groton has experienced no water-quality issues in the two-plus decades that he has helped oversee the system, but the department is developing a plan to reduce or eliminate manganese from the water supply. The undertaking will cost in the vicinity of \$7.5 million over several years. The proposal is being implemented piecemeal as the funding issue is resolved.

In addition to potable needs, the town’s

KEEPING COSTS DOWN

Every elected or appointed public official promises to make decisions in the best interests of constituents and the constituents’ pocketbooks. Not every official delivers on the promise. Groton, Massachusetts, town officials certainly seem to be trying — including Thomas Orcutt, water superintendent.

Whether it is Yankee frugality or a conscious effort to keep faith with taxpayers, town officials regularly try to partner with residents. Generally speaking, town budgets are conservative, as is evident in a sentence plucked from the proposed 2021 operating budget presented by Mark Haddad, town manager: “We looked for efficiencies in any area that would allow us to reduce an appropriation while maintaining services.”

The same spirit was evident in the Groton Water Department’s recent undertaking to upgrade and “optimize” two water wells. Water now is pumped from the wells more efficiently while saving \$8,000 a year in electricity costs and forestalling the sinking of a new well at a cost of perhaps \$3 million.

While Groton could have fully funded the well optimization project through grants, it chose instead to share the bounty of the state grant. “We could have requested full funding, but this would have taken away funds from other projects,” Orcutt says. “I felt it was better to request partial funding and let others reap some of the benefits of the state program.” Thus, being a good municipal neighbor, Groton borrowed the rest of the needed money through “very low” five-year loans.

In another instance of customer awareness, the Groton Water Department’s switch to cellular meter-reading from old-fashioned human readers will not result in higher water bills. “Replacing water meters is a cost of doing business,” Orcutt says. “So we are replacing the old water meters with better technology at no extra cost for the ratepayers.”

The ultimate benefit for the Groton Water Department being thoughtful stewards is customer trust. “Community support comes from trust,” Orcutt says. “I believe the Groton community has a great deal of faith in the operations of our local town government in general. We have exceptional staff members who try to give our customers the best service possible with little or no disruptions in service. We are public servants and want to serve our customers to the best of our ability and at a reasonable cost.”



every water system is water. It corrodes and rusts, erodes, leaks and floods. Keeping water flowing cleanly and dependably within proper channels is what maintenance is all about. To that end, many large and small water departments have at least a small fleet of equipment to roll out in response to a burst main or a corroded connection. Not Groton.

“We are a very small department and operation,” Orcutt says. “We’ve found that purchasing large capital equipment is not a good investment unless you’re utilizing the equipment 50% of the time or more. So, we mostly contract out services and equipment as we need it.”

The department’s field staff consists of only two technicians, which is too few to safely undertake repair projects of any magnitude, but the water distribution system obviously is sound despite its oldest parts. Emergency repairs and wholesale replacement of lines aren’t part of the regular routine.

“We try to do maintenance work in-house, depending on the level of sophistication. All electrical work and SCADA technology work, for example, is outsourced,” Orcutt says. The award-winning Whitney Pond Wells pump station project was bid out to contractors.

Affordable product

The value of the Groton Water Department — and every other water system — is measured in how reliably water appears when the tap is

turned on at home or the sprinkler system is triggered. The proof is in the puddling, so to speak. Orcutt believes the department, year in, year out, is making the right operational decisions and delivering an affordable product.

“Water costs for a family of five in town — such as my own — is very reasonable and affordable. A family of five might spend around \$400 a year on domestic water use.”

Water billing is pegged to a four-tiered domestic and irrigation rate structure. Furthermore, Orcutt says the town requires “all nonessential water use — outside water consumption — to be metered separately. Every dwelling unit must have two meters. No exceptions. This program was started 20 years ago and is an effective tool in managing demand during the summer. It explains to customers where they used their water and how they can be more efficient in their use.” ♦

12-inch water mains deliver plenty of volume to meet the Fire Department’s emergency needs. Consequently, the town boasts a Class 2 ISO fire rating, which Orcutt says is true of just 10% of water supply systems.

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CREATING CAREER PIPELINES

Internship program strives to build a more ethnically diverse workforce at San Francisco utilities

By *Ken Wysocky*

For unprepared water and sewer utilities, the impending wave of baby boomer retirements in the coming years poses a serious challenge in terms of succession planning. But officials at the San Francisco Public Utilities Commission see the so-called silver tsunami as an unprecedented opportunity to reshape the diversity of its workforce.

To that end, the commission — which supplies drinking water to 2.7 million customers in the Bay Area and wastewater services and electric power to city and San Francisco County residents — initiated an outreach program six years ago. The Project Learning Grant Partnership Program focuses on introducing children and teens to careers in the water, wastewater and electric-power industries, says Yolanda Manzone, deputy assistant general manager of external affairs.

“The program is a pillar in what we call a kinder-to-career approach to grooming the next generation of environmental stewards,” Manzone says. “Starting in kindergarten, we’re exposing children to basic ecoliteracy and environmental concepts in hopes of sparking interest in careers in our utilities.

“It’s hard to get people excited about and interested in jobs in these industries if they don’t have a fundamental background in ecoliteracy. This program provides youths of color or youths who live in underserved communities an entry point to a jobs pipeline for our utilities, which over time will help us diversify our workforce.”

The opportunity for boosting diversity certainly exists; Manzone says that about 50% of the roughly 2,300 commission employees are eligible for retirement within the next five years. And they’re primarily white males, she says.

Partnerships are key

The program’s underlying strategy is simple: Form partnerships with community-based, nonprofit organizations that already coordinate paid internships for youths and integrate into those programs a meaningful work-based experience at the commission. Manzone says the commission provides grants worth \$15,000 to \$25,000 to anywhere from 15 to 25 organizations every year; ratepayer revenue funds the grants.

“Those groups use the grants to carve out a chunk of those internships

to focus on water, wastewater and power issues ... through a project-based learning component,” Manzone explains. “We provide them with a curriculum that we developed specific to area water, power and wastewater issues.”

The students also participate in project-based programs that focus on increasing their understanding of issues facing the utility. For example, a filmmaking internship gave 14 teens an opportunity to create films about how the commission brings water to residents. In another internship, students learned about environmental stewardship and the basic principles of sustainable water, power and wastewater treatment technologies.

Through 2018, the latest year for which statistics are available, 2,815 students — mostly ages 14 to 19 — have participated in internship programs managed by 40 different community groups. The program targets youths who live in communities that bear the brunt of the utilities’ impact, Manzone says.

“These aren’t just disadvantaged children. We have a vested interest in recruiting employees from our most vulnerable and impacted communities ... where we, as a utility, have had a disproportionate impact. Some communities bear a bigger burden to provide the kinds of benefits (water and sewer service, for example) that everyone receives.”

As an example, Manzone cites a large treatment plant that handles 80% of the city and county’s stormwater and is located in a low-income community of color. “The people who live by that plant bear a bigger burden than others in terms of socioeconomic damages.”

Multifaceted approach

Manzone says it’s time-consuming to develop partnerships with so many nonprofit groups. But it also offers a primary benefit; by partnering with groups that already work with youths, the commission doesn’t have to build an internship program from scratch.

“We’re partnering with organizations that already have those internships built out. Our funding just adds another learning component — specific to water, power and wastewater — on top of it.”

One manager and one support-staff employee work on administering the program, but they also coordinate other programs, too, she says, so administering the program isn’t a full-time job.



“We have a vested interest in recruiting employees from our most vulnerable and impacted communities.”

Yolanda Manzone

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email editor@mswmag.com.

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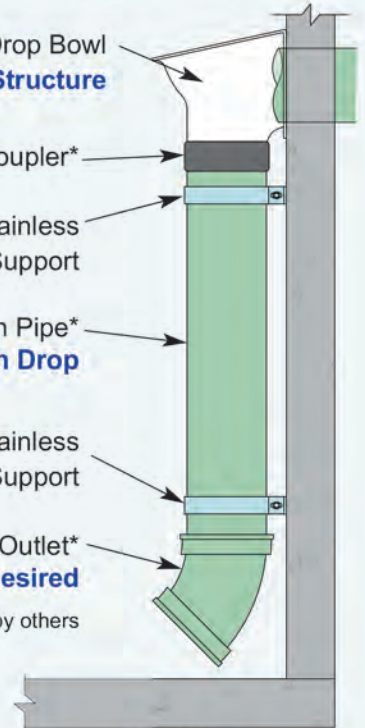
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“It can set these youths on a completely different career path to which they’d otherwise never be exposed.”

Yolanda Manzone

Manzone also notes that the grant partnerships aren’t the only way that the commission engages youth and familiarizes them with potential careers. It also administers educational programs at more than 230 schools and organizations. The programs

aim to show students how science, technology, engineering and math can play a role in sustaining natural resources. More than 77,000 students have participated in those programs since 2012, according to commission statistics.

Measuring success

So far, no student interns from the grant-partnerships program have become commission employees. But Manzone says this component of the commission’s efforts is more about career awareness and exposure, as well as getting an ecoliteracy perspective on what it takes to run a water, sewer and power utility.

“These youths then can graduate into other internship programs,” she says. “It’s helpful to think of it as stair-step progression, with this particular program located in midstair. After this, other programs come into play.”

The commission measures the program’s success by the number of youths of color who participate in the program and the exposure they receive to utility operations — awareness that just might spark an interest in a water, wastewater or power career, Manzone says.

“The intrinsic value lies in the fact that these students get this extra learning and awareness of potential careers. It can set these youths on a completely different career path to which they’d otherwise never be exposed.

“We see it in their eyes when they speak passionately about topics such as water access and water rights and environmental justice related to the water industry — subjects they never would’ve considered before. That’s the real value.” ♦

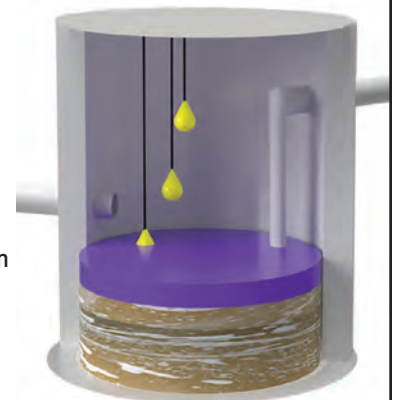
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EVALUATING CIPP EMISSION DATA

Study concludes Phase 2 of Trenchless Technology Center's investigation into CIPP safety concerns

By *Kyle Rogers*

The results of a study focused on the safety of emissions resulting from the steam-cured CIPP process are in. The Trenchless Technology Center at Louisiana Tech University was tabbed by NASSCO to conduct the study, and earlier this year, it released a report sharing its findings.

As part of the study, the Trenchless Technology Center collected data at nine CIPP project sites dating back to December 2018.

"The sites reflected variety — different geographies and climates, high altitude and dry and low altitude and wet, different times of the year," says Elizabeth Matthews, one of the members of the team heading up the study.

The pipe lengths and diameters also varied at the CIPP job sites in Shreveport, Louisiana; St. Louis; and Aurora, Colorado, where data was collected. Various emissions measurements were taken before, during and after curing at the job sites and the surrounding areas. Meteorological measurements like wind speed were also taken into account. Dispersion modeling was used to estimate compound concentrations for areas extending farther away from the job sites.

(continued)

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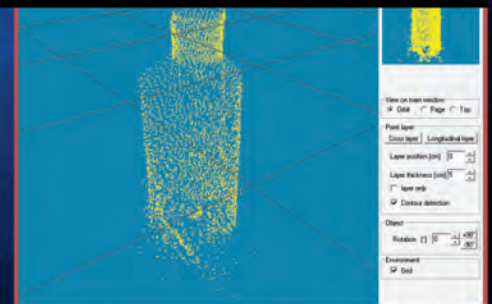
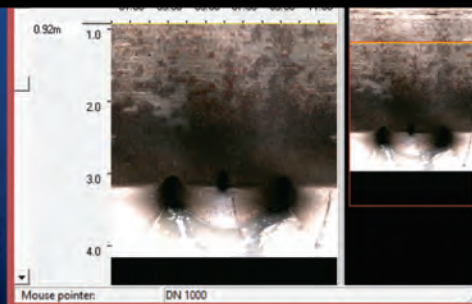
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A Trenchless Technology Center study of CIPP emissions showed no measurement taken at a distance of 10 feet or more from the termination manhole or emissions stack exceeding recommended exposure limits. The highest emission levels were detected in liner trucks and near emissions stacks.



Main focus

Though it wasn't the only chemical looked at (the study captured all 19 toxic organic airborne compounds on the U.S. Environmental Protection Agency's TO-15 list), styrene was the only one identified with concentrations significant enough to potentially pose a health risk to workers and the surrounding community. That potential health risk was based on action-level guidelines published by the EPA, OSHA and the National Institute for Occupational Safety and Health.

However, much of the emissions testing — using both directly measured and modeled data — showed styrene amounts below those health risk thresholds. Across the various job sites, the trend that emerged was that the liner truck opening and emissions stack posed the greatest concern.

"Because of the consistency of the data, those are the areas we focused on with our safety recommendations," says John Matthews, director of the Trenchless Technology Center.

The research team noted that the presence of a styrene odor on its own is not necessarily a sign of danger. Styrene produces a noticeable smell at levels far below the most conservative regulatory exposure limits.

In the study, no measurement taken at a distance of 10 feet or more from the termination manhole and/or the emissions stack exceeded recommended exposure limits. They were far below guidelines. Measurements taken in homes near exhaust points produced styrene concentrations less than 0.01 ppm, suggesting there is little danger of emissions collecting in homes and rising to potentially dangerous levels. Even near the insertion manhole, the highest styrene level measured was 26 ppm, enough for temporary irritation possibly but still below all published exposure guidelines.

Those relatively low levels of styrene were compared with the 100 to 200 ppm measured inside the liner trucks (none of the job sites used in the study did wet-out in the field). Levels near emissions stacks were mostly lower than the trucks, but they were still high enough to pose a potential health risk if workers' exposure exceeded the five-minute range.

Data was also collected by sorbent tubes worn by workers or at different



"We feel this is a pretty comprehensive study, but there's always an opportunity to collect more data."

John Matthews

points on the job sites to approximate worker exposure. None of this data revealed any instances where workers exceeded the exposure limits for longer than recommended, indicating that CIPP installers generally experience safe long-term exposures to styrene.

Recommendations

Based on the collected data, some of the safety recommendations include:

- Active air monitoring for anyone entering the liner truck, as well as the appropriate personal protective equipment for those workers.
 - A 15-foot perimeter around exhaust manholes and emissions stacks during curing. The perimeter can be entered for short amounts of time not exceeding five minutes. Beyond five minutes, the appropriate PPE should be used.
 - A minimum height of 6 feet for emissions stacks to enhance the dispersion of emissions and lessen the likelihood of workers entering the perimeter from having to cross into the plume, even when wearing PPE. "There was a lot of data collected," Matthews says. "We feel this is a pretty comprehensive study, but there's always an opportunity to collect more data." According to the research team, some areas of future study could include:
 - A look at task-oriented worker exposure to emissions to identify specific tasks that could pose a potential health risk.
 - Further study of the dispersion of styrene from the liner truck after it is opened to develop more definitive conclusions about dissipation time and the appropriate PPE to wear.
- The full report is available on the NASSCO website, www.nassco.org. NASSCO is also providing additional safety recommendations through its CIPP Safety Workgroup and is encouraging industrywide participation. Email director@nassco.org to join. ♦



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SAFE HYDROEXCAVATION ISN'T COMPLICATED

Regular reminders of simple but often-overlooked safety procedures make a big difference

By Giles Lambertson



“We have a tailgate meeting before every task is started, a job safety meeting before every job. Every day. You have to stay on top of that.”

Wade Glasscock

One of the first rules of safe hydroexcavation is to always use the smallest volume of water possible.

Longtime hydroexcavation operators may think they don't need safety courses anymore, but regular safety reminders can be the difference between heading home at the end of the day and being rushed to the emergency room.

Gary Toothe is a guy who can provide those reminders and help keep safety a top concern. He has spent the past decade promoting safe operation of high-pressure water and vacuum machinery in excavation and cleaning work.

Toothe's work in the industry began 35 years ago as a rookie tech on the working end of an industrial vacuum hose. He moved into middle management and eventually got into safety training “after I began getting too many accident

reports. I decided I would be the guardrail and start teaching people how to work safely.”

He became a certified OSHA expert and for the last 10 years has been training manager at Federal Signal. From his experience in the industry, he has crafted effective safety presentations that he gives all across the country. “Having worked on the vacuum hose years ago is kind of my hook. Yes, I have been there and done that, I tell an audience. Pretty soon I have them listening.”

His early days blasting and cleaning industrial sites predated hydroexcavators, “but we were using air compression and pressurized water and vacuums,” he says.

The dangers to bodies of operators were the same in 1984 as today. Then and now, limbs are sucked into hoses with disastrous results and fingers and other body parts are assaulted by water with shotgun force.

What Toothe talks about, however, is not principally about staying out of the way of all that suction and blasting power. Operators are well aware of the deadly forces they wield to accomplish a task. What they don't know, he says — or, rather, need to be reminded about — is the constant need to avoid bad habits when handling the powerful tools.

Bad habits

His top recommendation for safe and effective hydroexcavation might surprise you: Don't use too much water. “That's the biggie. That's what I try to push the most. OSHA requires that you use the minimal amount of water possible. Anything more is not acceptable. But some operators use way too much water and end up dumping chocolate soup.”

The extra water sometimes happens because an operator affixes the wrong kind of nozzle to the end of his wand and ends up loosening dirt by

(continued)



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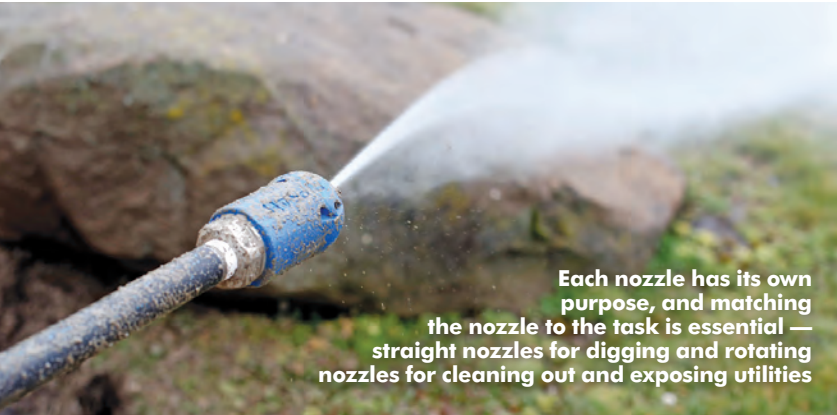
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Each nozzle has its own purpose, and matching the nozzle to the task is essential — straight nozzles for digging and rotating nozzles for cleaning out and exposing utilities

washing it away rather than cutting it away. “Each nozzle has its own purpose. I recommend a straight nozzle. A rotating nozzle is used way too much. It is supposed to be used to clean out and expose utilities. It liquifies the dirt. The rule against using too much water is consistently ignored.”

More to the point, the extra water permeates the ground, softening it and weakening the walls of an excavation. That leads to Toothe’s second reminder: Don’t stand too close to the edge without a physical restraint. It seems rudimentary, “but operators literally put their toes out over the hole. I see people just hanging out over the hole. If that ground gives way, bad things happen. If it caves in, good luck trying to hold on to the remote and shut down the machinery.”

Toothe distinguishes between a fall “restraint” and fall protection. He recommends using a harness tied off to a truck that will prevent an operator from falling rather than relying on systems that might mitigate the effects of a fall. “If someone falls into a hole or trench he is digging, he’s exposed to the vacuum suction or high-pressure water. You want to avoid falling even 2 or 3 feet because you are exposed. I would rather eliminate the fall altogether by tying off to the truck.”

Work together

“The last thing I would recommend, to give just two or three rules, would be to never work by yourself. If something happens to an operator and no one else is there to shut down the truck ...” Toothe says, leaving the consequences unstated. “I just got back from talking to hydroexcavator crews working for the oil industry. Sometimes they’re in the field and no one is around for miles and miles, not until the end of a shift. If something happens to a lone operator in those circumstances ...”

Mark Allen agrees. The general manager of Diversified Underground, based in Aurora, Colorado, says he normally sends out two-person teams on his hydroexcavation jobs. “I can’t say there isn’t a time when they work alone, maybe if they are excavating a shallow trench, but if we are locating utilities, I always send a two-man crew.”

Safety aside, some would argue it’s more efficient to send out two operators in two trucks to do two jobs rather than double up on one. Allen doesn’t believe it. “I find that’s not the case. When we are doing a pothole, a sin-

gle operator has to set out equipment, unpack hoses, get water by himself and dig by himself, holding the dig rod and manhandling a 6- or 8-inch hose — to me that’s a lot slower. Plus, the guy gets tired but still has to backfill by himself and then do the paperwork. You might save a little on labor by sending out one guy, but it isn’t as productive.”

Toothe completely concurs. “That’s what I hear all the time: That it’s more efficient with one person. Well, I did studies. If you have two people working on a job for 12 hours, productivity might be a little less, but it is still about 85% of the optimum. With one guy by the end of the 12 hours, he is working at 30% of optimum. He’s burned out. You save on labor, but you don’t increase efficiency.”

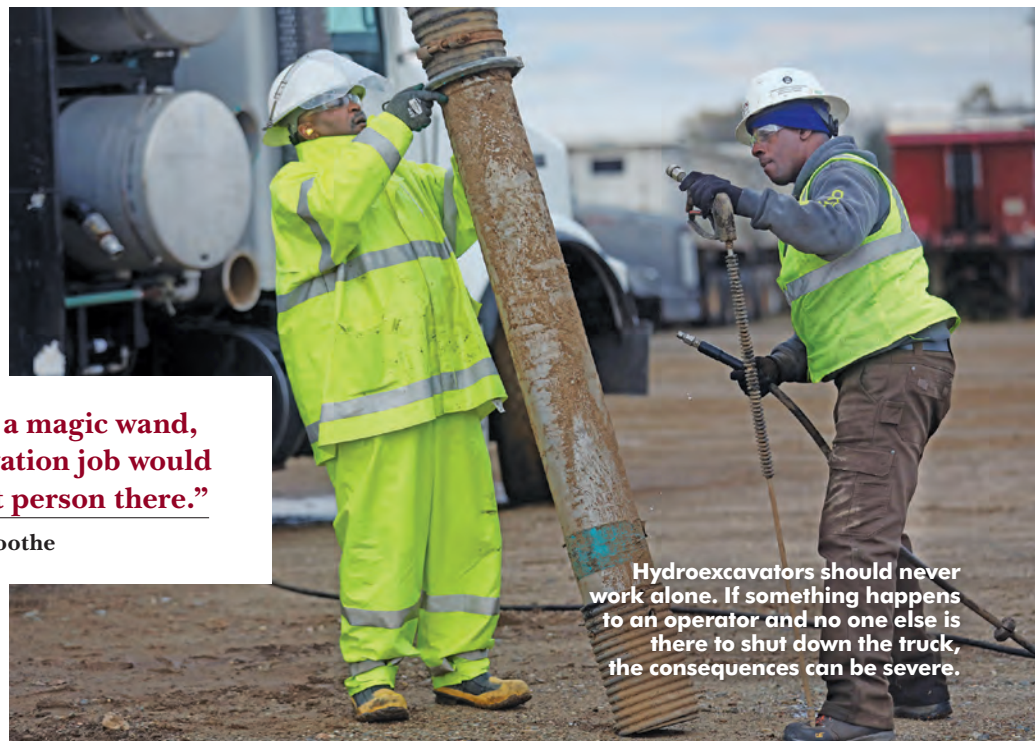
Toothe is agnostic about which is the more dangerous component on a hydro rig — the high-suction vacuum or the high-pressure water. “If you have a dead-man trigger, the water stops in an emergency. It didn’t used to be that way. We used to have ‘suicide nozzles’ that lacked a shut-off. We have eliminated most of them, so high-pressure water is not so much an issue. However, vacuum doesn’t stop unless you hit the remote. If you have two men on a job, everybody should be fine in an emergency.”

Continued training

Wade Glasscock of Smith Industrial Services in Mobile, Alabama, is a long-time advocate of safety training. Today he oversees the trainer, but he used to do the training himself. All 300 people in the company who work with high-pressure equipment are safety trained, from new hires to veterans.

“In some companies, they put new hires out there without the training,” he says. “They’ll hire temporary labor and let them do the tunnels. Our training includes training the attendants. They have to know enough to take care of everything in an emergency. As for the old hires, we have a tail-gate meeting before every task is started, a job safety meeting before every job. Every day. You have to stay on top of that.”

A two-person buddy system is an absolute operating procedure at Smith Industrial Services, as is wearing protective clothing. “We use Kevlar on every-



“If I could wave a magic wand, every hydroexcavation job would have a competent person there.”

Gary Toothe

Hydroexcavators should never work alone. If something happens to an operator and no one else is there to shut down the truck, the consequences can be severe.



It seems rudimentary, but operators have to be careful not to stand too close to the edge of an excavation without a physical restraint.

thing. Anything under 4,000 psi we consider power washing, but operators still need to wear face shields and hard hats. Over 4,000 psi, they wear safety boots and pressure-resistant gloves. Depending on the job, we go up on our expectations of what they should wear,” Glasscock says.

Allen says the rocky dirt of Colorado impacts his operators’ decisions. “Excavating in Colorado soil can be pretty brutal. Our operators are trying to do everything correctly, but a contractor can be standing there saying he wants to get this job done and sometimes my guys will turn up water pressures to get more cutting action. They do sometimes cut corners, but they never do when it comes to safety.” Allen says he would counsel new hydroexcavator operators to “never cut a safety corner and put yourself and a utility in jeopardy.”

Toothe believes all operators should start out by reading safety and operation manuals. Revisiting the manuals is almost as important. “Problems happen when shortcuts become ingrained in working culture. They become internalized.” That is, bad habits and rationalizations take root. “‘There is one chance in a hundred that this or that will happen if you take a shortcut.’ People say that sort of thing. But then they do it a hundred times.”

Toothe wishes every operator would take an OSHA competent person trenching class to “understand soil dynamics and recognize the signs of imminent collapse of a trench wall. If I could wave a magic wand, every hydroexcavation job would have a competent person there.”

He notes that every operator who has created a hole or trench that someone else will be entering is legally liable in the event of a collapse. The creator of the hole is as liable as the project owner ordering it, the contractor whose people are entering the hole or trench, and the contractor responsible for shoring it properly.

Of course, not every hazard can be foreseen and prevented. In fact, Glasscock says the biggest danger for his hydroexcavation crews has nothing to do with the equipment or the operator — it’s the surrounding traffic. “There are so many people moving around in public places, so many distractions. We can have a 40-foot-long truck with its lights flashing and some girl texting while she’s driving runs into us. Our guys don’t back up trucks into holes. They don’t cut off their feet with high-pressure water. None of that. It’s traffic that’s the big hazard.”

There will always be dangers in hydroexcavation work, but breaking bad habits will go a long way toward keeping you safe on the job. ♦



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A BREATH OF FRESH AIR

Innovative pump station upgrade project eliminates odor problems

By Thomas Renner

Asophisticated pump station utilizing innovative technology is helping clear the air in Seminole, Florida.

Pinellas County Pump Station 16 is one of the county's major stations and moves wastewater from four collections basins in the area. Odor problems around the station, which is located in a commercial zone with nearby businesses, had caused significant consternation within the community.

"It's like rotten eggs, really bad rotten eggs," Kris Van Kirk told local ABC affiliate WFTS before the project started. Van Kirk works at a car wash near the pump station. "It's a stench so bad that it will make your stomach turn."

Earlier this year, the county completed a 13-month, \$2 million renovation of Pump Station 16. The renovation replaced major components to a station that was constructed about 30 years ago. Over time, system components degraded in the highly corrosive atmosphere and caused foul odors to seep into the surrounding area. After numerous community complaints, the county started a process two years ago to renovate the station, with construction beginning in January 2019.

Before implementing the new system, Pinellas County took deliberate measures to learn what odors were sifting into the community. "One of the most well-known odors that everyone is aware of is hydrogen sulfide, which is the smell people associate with rotten eggs," says Tom Menke,

Pinellas County Utilities engineering section manager. "But once you treat that, there may be some odors underneath that may come to the top."

Menke says tests revealed underlying odors from mercaptan, a harmless gas consisting of carbon, hydrogen and sulfur. Mercaptan has the smell of rotting cabbage or eggs and is often added to natural gas to make leaks easier to detect. It is also highly corrosive.

Ozone polishing

Dealing with the station's odor issues required the implementation of new pretreatment measures. Perhaps the most unusual aspect of the newly installed system is an ozone polishing component (Engineered Air) that combats mercaptan. The polishing helps reduce odors that might escape the wastewater treatment plant. Ozone treatment has been used in treating drinking water, but it is relatively new in the wastewater industry.

Using a generator, ozone is created by imposing a high-voltage alternating current across a dielectric discharge gap that contains an oxygen-bearing gas. Ozone is unstable and decomposes into oxygen shortly after generation.

Ozone-generating systems are generally used at medium to large-sized plants, according to the Environmental Protection Agency. Ozone is more effective than chlorine in destroying viruses and bacteria, and the ozonation process utilizes a short contact time. Ozone is also generated on site, reduc-



ing shipping and handling costs and resulting in fewer safety problems.

The EPA says ozonation also has some disadvantages. It is not economical for wastewater with high levels of suspended solids, biochemical oxygen demand, chemical oxygen demand or total organic carbon. Systems can also be expensive, and ozone can be irritating to the lungs. It is also



Pinellas County Pump Station 16 had long suffered from odor problems before a \$2 million renovation that replaced the station's major components.

corrosive and should be used with corrosion-resistant material, such as stainless steel.

Menke says ozone treatment is rare for Florida, but the county knew it needed to upgrade its system.

It also replaced a chemical scrubber unit that had lost its effectiveness. "Chemical scrubber systems work well to a point, but we thought it was

in our best interests to replace it," Menke says. "This system is biological, not chemical, so it should be better for the environment."

Additional measures

Two other components were also included in the renovated pump station. One process includes the use of activated carbon (BioAir Solutions) to bind different chemicals through adsorption,

"This system is biological, not chemical, so it should be better for the environment."

Tom Menke

which is the adhesion of a thin layer of molecules to the surfaces of liquids with which they come in contact. The carbon removes organic and some



“When you put something in that environment, it will corrode, especially over a long period of time.”

Jake Warren

inorganic substances. For years, activated carbon has been an effective treatment to remove contaminants from wastewater streams.

Trickling filters from BioAir Solutions were also used in the new system to remove organic matter from wastewater. The filter is an aerobic treatment system that utilizes microorganisms attached to a medium to remove organic matter. As the wastewater flows over the medium, microorganisms already in the water gradually attach themselves to the rock, slag or plastic surface and form a film. The organic material is then degraded by the aerobic microorganisms in the outer part of the slime layer.

An opening

The conditions that caused the stench seeping into the community also impacted equipment at the pump station. Floor doors that allow access to valves and pumps saw serious corrosion.

“The existing doors did not close well,” says Jake Warren, whose company, TLC Diversified, completed the system overhaul. “I was scared to walk on some of them because they were so corroded. When you put something in that environment, it will corrode, especially over a long period of time.”

The renovated facility includes 16 aluminum doors manufactured by The BILCO Co. Some of the doors were BILCO’s JD-AL H20 doors, which are reinforced for AASHTO H-20 wheel loading. That feature allows heavy trucks and other industrial equipment to park on them.

The new doors carry a 25-year warranty and are equipped with type 316 stainless steel hardware for superior corrosion resistance and BILCO’s patented lift assistance for easy, one-hand operation.

No more complaints

Menke says residents and store owners are relieved the new system is in place.

“Everyone in the community experienced the odors that were coming out of that system. We have a good system working now.” ♦

About the Author

Thomas Renner writes on building, construction and manufacturing for U.S. trade publications.



Top: A crew member opens an access door to check pump equipment at Pinellas County Pump Station 16. Left: Aluminum BILCO doors provide access to below-grade pumps and valves and have solved the corrosion problems that had plagued the pump station.

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PROPER CERTIFICATION REQUIRED

Protecting the integrity of training programs is key to quality assessments

By Sheila Joy

I was recently made aware of an organization that was allegedly using NASSCO Pipeline Assessment and Certification Program materials to train in-house employees. The problem? The “trainer” wasn’t even PACP-certified — his certification lapsed in 2012 — and he has never been certified as a NASSCO trainer.

The manuals the organization was using to train its students were copies of PACP Version 4 — we are currently on Version 7.0.3 — so the curriculum was not current. Most important, NASSCO was not aware of these classes and the individuals attending were not recognized as being PACP-certified.

All NASSCO training programs and materials, including its PACP, Manhole Assessment and Certification Program, Lateral Assessment and Certification Program, and Inspector Training and Certification Program for CIPP and manhole rehabilitation technologies are the trademarked and intellectual property of NASSCO Inc.

Unfortunately, no matter how hard we try to protect NASSCO property, occasionally we still uncover NASSCO training programs promoted or used inappropriately and, in some cases, illegally. These infringements have included everything from “borrowing” PACP course content for use in other training programs to falsification of certificates and ID cards.

NASSCO would appreciate your help in identifying these situations and making us aware of them in order to protect the quality of condition assessments and inspections and also to ensure that individuals paying for and receiving training are taught by quality NASSCO trainers and receive legitimate certification.

One simple way you can help is to always check that a certified individual has current PACP or ITCP credentials and that the certificate he or she holds has not expired. The fastest and easiest way to do this is to visit www.nassco.org/certified-individuals. Once there, you can search by a person’s name or certificate number to confirm the individual has a valid NASSCO certification for PACP, MACP, LACP and/or ITCP. You can even search by location to get a listing of all certified individuals in a specific geographic area.

It is important to us to continue to set standards for the assessment, maintenance and rehabilitation of underground infrastructure. One of the ways we accomplish this is to ensure all certified individuals have the quality education they need to do the job right.

For more information, visit www.nassco.org. ♦

NASSCO (National Association of Sewer Service Companies) is located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 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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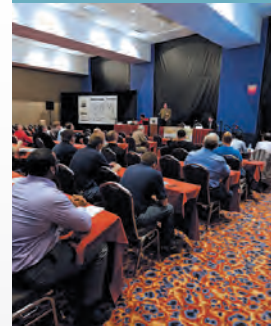
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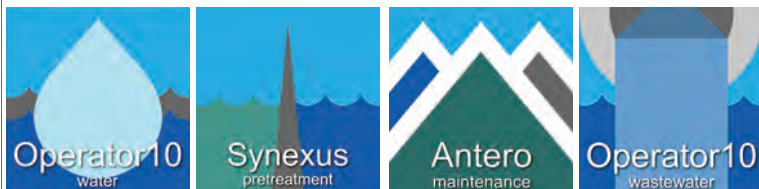
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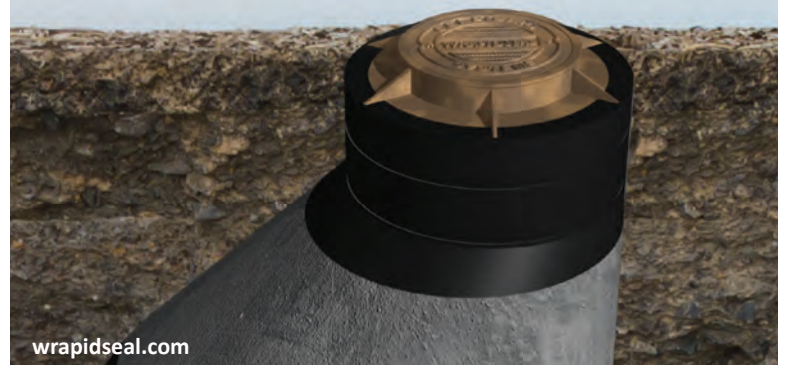


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MANHOLE EQUIPMENT AND REHABILITATION

By Craig Mandli

APPLICATOR

Aries Industries test and seal grouting system

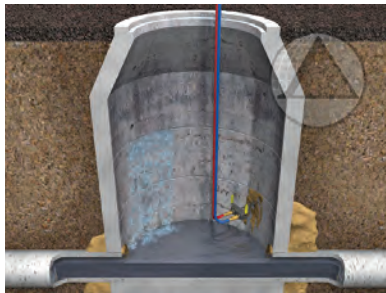
The test and seal grouting system from **Aries Industries** reduces setup time and provides efficient hands-on control to quickly seal leaking joints. Grout — pumped to a leaking joint — flows through the leak, sealing the surrounding soil to form an impenetrable barrier. Sixty-gallon tanks and continuous-duty mixers provide high volume to seal large voids. Reels for fast deployment and retrieval, as well as high-power winches, quickly move the packer from joint to joint for high productivity. The unit's 800 feet of color-coded hose allows long runs. The truck comes with a bench, storage and room to work. The operator tests and seals the joints while working in the control room, where test data and the sealing process are easily viewed, recorded and logged. **800-234-7205; www.ariesindustries.com.**



CHEMICAL GROUTS

Avanti International injection grouting

Every manhole is unique. Therefore, there is no one-size-fits-all rehabilitation method, but it begins with a thorough condition assessment. Manholes are vulnerable to defects and a significant contributor to inflow and infiltration in collections systems, leading to excess flow to treatment plants and increased cost to ratepayers. As a stand-alone solution or first step in a multistep process, injection grouting from **Avanti International** stops active infiltration, stabilizes surrounding soils and fills voids outside the structure. Complementary to cement coating and epoxy lining, injection grouting can be a first defense against infiltration. There are multiple techniques for grouting manholes: for brick manholes, curtain grouting is recommended to create an impermeable barrier and positive seal outside the structure; for precast manholes, spot repair, vertical crack injection and horizontal joint injection are acceptable methods. Injection grouting can be a low-cost/high-reward, long-term solution for extending manhole service life. **800-877-2570; www.avantigrout.com.**



Prime Resins PR10

PR10 acrylamide from **Prime Resins** is a low-viscosity permeation chemical grout that is injected from within the manhole, wicking into the soil outside or used to curtain-grout the exterior. A high-pressure pump injects grout through the manhole wall into the surrounding soil, creating an impermeable barrier. The permeation grout doesn't expand, but rather saturates the soil immediately outside of the manhole (with a desired gel time) that permanently stabilizes the soil and prevents further groundwater penetration. **800-321-7212; www.primeresins.com.**



EPOXIES

Epoxytec CPP Sprayliner MH

CPP Sprayliner MH from **Epoxytec** is designed to rehabilitate sanitary sewer collections system assets and other underground, cylindrical and/or small box structures in contact with hydrogen sulfide and in need of I&I mitigation with sealed lining. It performs in areas subject to chemical attack and as a seal preventing oxidation while holding back water migration, I&I and hydrostatic pressure. The material can be sprayed ultra-high-build, up to a 1/4 inch per pass. Blended with reinforcing agents and various fibers, the material when cured creates reinforcement lining as a fiber-reinforced polymer, with high-strength and flexural properties for partially or fully deteriorated structures. **877-463-7699; www.epoxytec.com.**



Infrastructure Repair Systems Infragard

Infragard concrete and manhole rehabilitation products from **Infrastructure Repair Systems** include Top Coat and Chim-Coat, which are nonhazardous ambient-cure epoxy systems for a small patch, entire manhole or retaining wall. This cost-



effective solution requires no expensive equipment, as it has an easy trowel-on application. They are corrosion-resistant and high-strength, with an impermeable structural bond to the substrate or to almost any concrete or metal surface. Chim-Coat is engineered with a flexible feature that maintains adhesion while expanding or contracting with changing temperatures and traffic loads. **877-327-4216; www.irsinet.net.**

Neopoxy NPR-5305 One-Step Kit

The 0.5, 1-, 2- or 3-gallon **NPR-5305 One-Step Kit** from **Neopoxy** makes protective lining easy. The kit can be used for the repair and protection of corroded or new manholes, sumps, wet wells, pipelines, vaults, tanks, concrete surfaces, exposed aggregate, cracks and CIPP end sealing. With a simple, one-step mixing process, there's no need to worry about weighing, measuring or messy cleanup. Both the resin and hardener epoxy components are prepackaged in a single bucket. With only a drill and mixing paddle, the epoxy can be prepared for application in minutes. Once applied, the epoxy quickly cures into a high-strength, chemical and corrosion-resistant protective lining that can last for decades. **510-782-1290; www.neopoxy.us.**



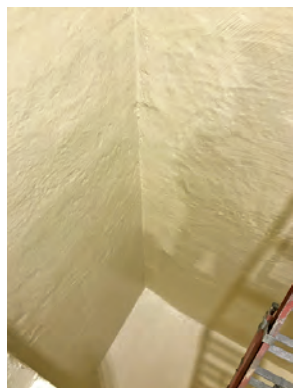
Picote Solutions Dual-Color Epoxy Brush Coating System

The **Dual-Color Epoxy Brush Coating System** from **Picote Solutions** allows technicians to rehabilitate pipes from 1.25 to 12 inches for drains, sewers, water pipes, electrical conduits, and heat and air-conditioning ducts by brush-casting a coating. The coating resin forms a pipe inside the original pipe that is a tested, safe and environmentally friendly product. The new pipe is dampproof, corrosion-resistant and wear-resistant. It is ASTM and NSF certified (NSF/ANSI 61-5). It is a 100% solids epoxy, and the method allows for clear visual verification during the application process. Apply to small areas or all drains in multistory buildings. The system is practical and easily fits in tight places. **219-440-1404; www.picotesolutions.com.**



Sauereisen SewerGard 210XHB

SewerGard 210XHB from **Sauereisen** is an epoxy protective lining specifically formulated for municipal wastewater environments. It provides a chemical-resistant barrier for concrete, masonry, brick and steel substrates. As a 100% solids epoxy polymer, it sets fast and provides a quicker return to service. The high-strength lining enables high-build capabilities from 10 up to 300 mils in a single coat, reducing need for a second coat. It is moisture-tolerant to accommodate damp substrates and may be applied to SSD substrates, reducing time spent waiting for the substrate to dry out. It is also resistant to hydrogen sulfide, sulfuric acid, microbiologically induced cor-



rosion and wastewater treatment chemicals. Installation is completed using plural-component spray equipment. **412-963-0303; www.sauereisen.com.**

INSERT

Parson Environmental Products high-density polyethylene manhole inserts

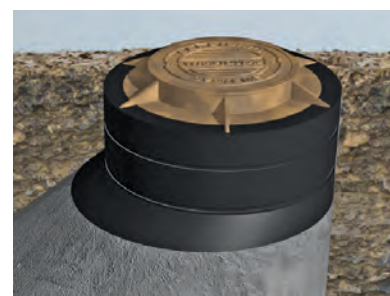
High-density polyethylene manhole inserts from **Parson Environmental Products** can help eliminate surface water inflow along with unwanted hydrogen sulfide odors and are easy to use and maintain. They include a vented PVC canister that stores 20 pounds of either activated or catalytic carbon. The result is a product that traps and stores all of the unpleasant hydrogen sulfide and methyl mercaptan odor molecules before they are released into the atmosphere. The only item that needs to be replaced periodically is the 20 pounds of carbon since it serves as the absorbent media that traps the odor molecules. One person can easily accomplish this. **800-356-9023; www.parsonenvironmental.com.**



MANHOLE LINER

CCI Piping Systems WrapidSeal Manhole Encapsulation System

The **WrapidSeal Manhole Encapsulation System** from **CCI Piping Systems** consists of an engineered primer and a wraparound, heat-shrinkable sleeve designed to seal joints and prevent groundwater from entering a collections system. This material has a high-shrink membrane (70% stretch and 40% recovery) designed to shrink around any manhole profile. In addition, the high tensile strength accommodates structural movement, while the tough backing resists soil stress and provides suitable abrasion resistance. It can be used for new construction or for the rehabilitation of existing manholes to control infiltration through joints and prevent deterioration, thus eliminating costly maintenance repairs and the added expense of treating groundwater. **800-867-2772; www.wrapidseal.com.**



MANHOLE PARTS AND COMPONENTS

RELINER/Duran Modular Manhole Invert Channel System

The **RELINER/Duran Modular Manhole Invert Channel Systems** use molded fiberglass flumes with smooth sewer pipe interfaces to rehabilitate inverts without flow interruption. The field-installed modular components bolt together

(continued)



inside the manhole and serve as the form for a new concrete bench. They eliminate the inconsistencies associated with field-formed concrete channels. The full-depth lined channels are high-flow and easy to clean and maintain. Standard 8- and 12-inch-depth channel sections fit through a 24-inch manhole frame and will accommodate 6- to 12-inch pipes. Larger sizes are available. Parts are selected based on the unique configuration of each manhole. **800-508-6001; www.reliner.com.**

Sealing Systems Infi-Shield Gator Wrap

Infi-Shield Gator Wrap from **Sealing Systems** prevents infiltration and erosion by providing a watertight seal around any manhole, catch basin or pipe joint. It resists harsh soil conditions and provides a root barrier for any crack or joint. It is made of a stretchable, self-shrinking, intracuring, halogenated-based rubber with a minimum thickness of 30 mils. The back side of each seal is coated with a cross-linked reinforced butyl adhesive. The seal is designed to stretch around the joint and then overlap, creating a cross-link and fused bond between the rubber and butyl adhesive. It installs easily with no special tools and can be immediately backfilled. **800-478-2054; www.ssisealingsystems.com.**



MANHOLE REHABILITATION

The Strong Co. Strong-Seal High Performance Mix

Strong-Seal High Performance Mix from **The Strong Co.** is a pure-fused calcium aluminate mortar that stops infiltration, restores structural integrity and protects against microbiologically induced corrosion in sanitary sewer systems with harsh sulfide conditions (pH greater than 1.0). As the pH level of the structure evolves downward, this product regulates microbial activity, providing corrosion protection. It is reinforced with alkaline-resistant fiberglass. When spray-applied to a minimum 1/2-inch thickness, it is intended to form a structural monolithic liner covering all interior substrate surfaces. When correctly applied, this material exceeds the compressive and flexural strength of the original structure. **800-982-8009; www.strongseal.com.**



SAFETY EQUIPMENT

Perma-Liner Industries Manhole Edge Protector

The **Manhole Edge Protector** from **Perma-Liner Industries** is made with a highly visible safety orange that helps identify the site and the open manhole, eliminating potential hazards. The 360-degree edge protection also eliminates the top-edge roller and top-wide tiger tail



that can allow the cable to slip off the roller. The interior 3.5-inch flange holds back debris and any loose infrastructure from falling into the manhole. It is made with ABS 3/16 plastic, which is durable and withstands temperatures from 40 degrees below zero to 180 degrees F. The Manhole Edge Protector leaves the manhole completely open, providing accessibility and visibility while also protecting the camera and jetter lines. **866-336-2568; www.perma-liner.com.**

Rock Mills Enterprises The Lifter and The Lifter PLUS

The Lifter and The Lifter PLUS from **Rock Mills Enterprises** are vehicle-mounted, automated solutions to remove heavy network access lids and storm grates. They enable the removal of covers and grates safely and efficiently with the push of a button on a hand-held remote, from conventional-sized covers to very heavy, large-diameter covers. Optional accessories include a roadway camera with vehicle dash monitor, as well as swing arms and a grate attachment. They have versatile vehicle applications including pickup-utility trucks, large combo sewer trucks, jettors and CCTV trucks. **712-451-6550; www.rockmillsent.com.**



SEALANT

Cretex Specialty Products LSS Internal Manhole Chimney Seal

The **LSS Internal Manhole Chimney Seal** from **Cretex Specialty Products** is a mechanical seal installed on the frame and grade ring sections of sanitary sewer manholes. These seals eliminate and prevent manhole frame-chimney inflow. During wet weather and snowmelt, clearwater enters manholes through deteriorated or broken frame-chimney joints. This deterioration can be caused by frost heave, soil movement, traffic loading, thermal expansion and contraction of the surrounding pavement, and poor or antiquated construction methods. Each seal is made up of an EPDM sleeve and type 304 stainless steel expansion bands, and it can be easily removed and reinstalled to allow for future manhole adjustments. It has a 50-year design life and is available in four widths, allowing complete chimney coverage of up to 24 vertical inches with a single seal. **800-345-3764; www.cretexseals.com.** ♦



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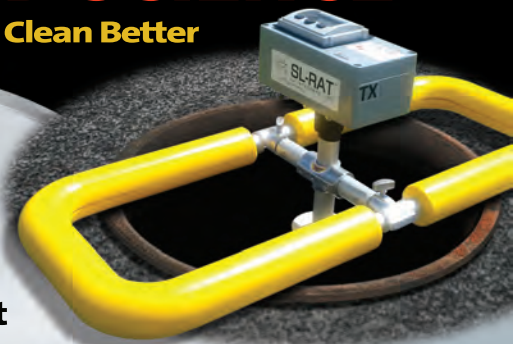
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Manhole risers are a fit for picturesque town

Problem:

New Philadelphia, Ohio, population 17,000, is the county seat of Tuscarawas County. Keeping this old, picturesque town in tiptop shape is partly the responsibility of Brian Myers, wastewater superintendent. One of Myers' responsibilities is the raising of city manholes to grade after roads are repaved or when manholes fail and need to be rebuilt or repaired.



Solution:

Myers employed the pivoted turnbuckle. **American Highway Products** manhole risers are open, flexible rings of high-quality, galvanized steel with a turnbuckle that can be expanded or contracted with a screwdriver to fit snugly into original utility rims. They're available in precisely sized increments to match any manhole rim diameter and any paving lift thickness needed to bring manholes exactly to new paving surface grades. The adjustable risers make it possible to raise dozens of manholes in a day, all while avoiding extensive traffic closures. They can take as little as 10 minutes to install, with no excavation or hot patching required.

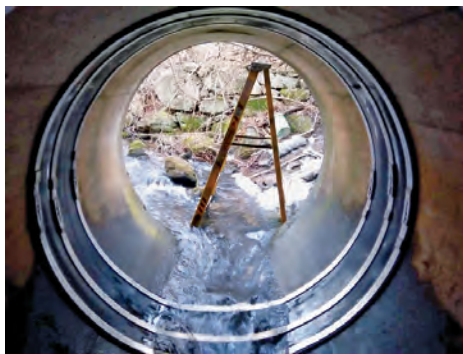
RESULT:

In 2019, the town installed 35 of the pivoted turnbuckle risers, including 25 on a single resurfacing project carried out by the state on New Philadelphia's South Broadway Street. **888-272-2397; www.ahp1.com.**

Seal system allows for trenchless culvert repair

Problem:

A culvert in Watertown, Connecticut, had a significant water flow and erosion problem that led to culvert joint separation, invert deterioration, erosion issues and headwall damage. The erosion had undermined the outlet, which resulted in a disruption in water flow. With the age of the culvert, the inlet headwall was made with stacked stone. Over time, these stone headwalls can settle, weaken and start to lose structure. This culvert was located under a roadway that also has challenges with traffic control. The separating joints caused concerns with the above roadway being damaged by infiltration.



Solution:

HydraTite seals from **HydraTech Engineered Products** were installed over the culvert joints for a permanent solution to the separated joints that were leaking and eroding the ground below the roadway. Five tons of large-diameter stone were placed over the existing outlet void to prevent further

deterioration and erosion by restoring natural water flow. The stone headwall was encased in two layers of concrete to prevent further structural damage and environmental erosion. The job consisted of the installation of nine HydraTite seals that were 72 inches in diameter, placement of 5 tons of riprap, concrete patching inside the pipe and concrete casing of the inlet stone headwall.

RESULT:

The solution enables a trenchless repair at a fraction of the cost of fully lining the pipeline. The sealed joints and repaired invert will restore the hydraulics and eliminate damage to the above roadway by preventing infiltration. All of this work was completed from the side of the road with minimal traffic disruption. The seal proved to be an economical in situ repair solution. **513-827-9169; www.hydratechllc.com.**

Manhole and catch basin rehab accomplished without business disruption

Problem:

Bay City, Michigan, was experiencing multiple failing sanitary sewer manholes and stormwater catch basins in a heavy-traffic area of its downtown business district. Cave-ins and heavy infiltration were present in most of the structures, and remediation of numerous issues needed to be completed in a short window of time with the least amount of disruption to the business community as possible.



Solution:

Terry Killburn, sewer maintenance manager for Bay City, received a recommendation from Granite Inliner to contact Advanced Rehabilitation Technology (ART) about using **OBIC Armor** — a multilayer, fast-set, spray-applied polyurea trenchless rehabilitation solution from **OBIC** — to resolve the issues. Upon deployment, ART crews first removed debris and pressure-washed all the structures to be rehabilitated. Most required the use of dryers to remove all moisture from the substrate, and crews applied grout in the manholes or catch basins that were missing mortar or experiencing major leaks and infiltration. Once properly prepared, the installation team applied OBIC Armor at a thickness of 500 mils. Each structure required approximately three to five hours to complete, and OBIC's product application process allowed for zero downtime. All of the assets for the project were renewed successfully within two months.

RESULT:

Bay City's aging downtown underground sanitary and stormwater conveyance system structures have been given an extended life span in excess of 25 years with minimal disruption to the community and lower costs than replacement. "The installers were top-notch and had excellent communication skills," Killburn says. "Best of all, we didn't receive any complaints from our business community during the project." **866-636-4854; www.obicproducts.com. ♦**

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Product Spotlight

Carbide-tipped tracks provide ultimate crawler traction

By Craig Mandli



When choosing a crawler camera for pipeline inspections, you must consider the cost of ownership. Repair costs can be daunting, regardless of the brand.

The parts that typically need replacing first on these units are the wheels and tracks. TruGrit Traction has specialized in these replacement wheels for most types of crawlers on the market for several years, and it now offers replacement track assemblies for tracked crawlers as well. The company recently unveiled a new steel track assembly designed to solve traction issues in slippery or greasy pipes.

Following the company’s mission statement — focused on making a contractor’s equipment perform better, regardless of the brand — the new steel track assemblies not only use a softer rubber that provides better grip on slippery surfaces, but they also have carbide-gritted steel cleats for additional traction.

“The steel cleats are placed in an orientation that allows for at least three of them to touch the pipe at once,” says Tom Rebozo, director of sales for TruGrit Traction. “This serves to optimize the performance of camera transporters in varying pipe types and conditions.”

According to Rebozo, adding the carbide-tipped steel cleats to the

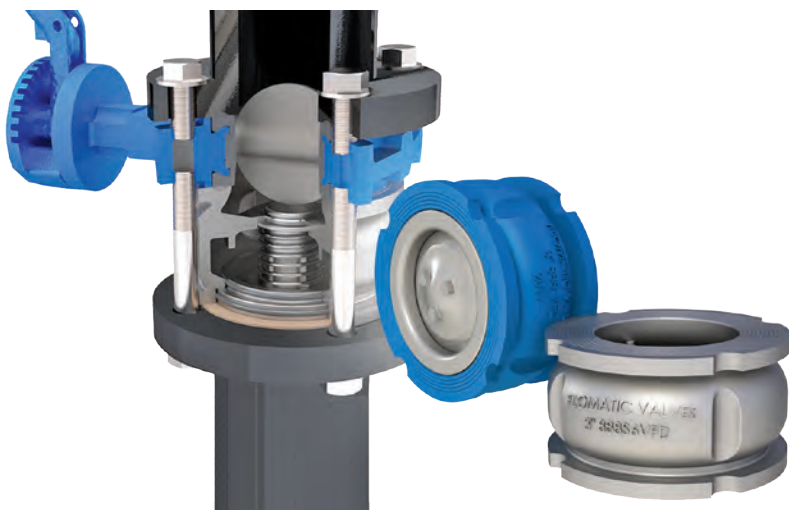
tracks will also prolong the life of the rubber cleats, as less pressure is being put on the rubber cleats during inspections. That means more inspections and a longer time between track replacements.

He says the product was developed at the request of several of the company’s customers. “One of the biggest complaints we hear from contractors using tracked crawlers is slipping and not being able to get traction in greasy pipes,” he says. “We’ve been making our carbide crawler wheels for years, so offering tracks was a logical step for us. We believe the carbide technology carries over very well to the tracks.”

The steel track assemblies can be manufactured for any tracked crawler or tractor currently on the market, no matter the age. The tracks can easily navigate through greasy pipe, where wheels can be slowed or stopped. Tracks are also useful for smoother video in corrugated steel or HDPE pipe.

“Solid stainless steel carbide tracks aren’t a new idea, but as far as I know, we’re the first manufacturer to offer them,” Rebozo says. “People are excited. They solve a pretty big problem in the industry.” **407-900-1091; www.trugrittraction.com.**

SPECIAL REPORT



Flomatic wafer-style check valves

Flomatic’s Model 888VFD wafer-style check valves can be close coupled with a butterfly valve, allowing for operation of the butterfly valve in an open or closed position with no interference. It’s unique poppet design operates quietly and efficiently across a wide range of flow velocities, which makes it ideal for varying flow rates in VFD-controlled pumping systems. The design helps minimize flow losses and hydraulic shocks in the pump system. The spring-loaded poppet system is guided in an oversized sleeve for stability, resulting in quiet and efficient operation regardless of flow rate. The valve begins to close as flow is reduced and fully closes at zero velocity stopping reverse flow, helping to reduce water hammer shock. It is suitable for direct mounting of butterfly valves eliminating the need for a 2- to 6-inch spool piece. The valves save energy and maintenance costs, and are rated NSF/ANSI 61 and NSF/ANSI 372, and they meet MSS-SP 125. **800-833-2040; www.flomatic.com.**

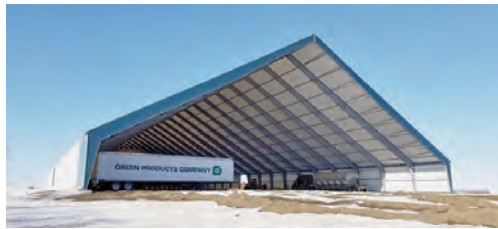
Best Purging Systems Model YZ102 purge unit

Best Purging Systems Model YZ102 is a Type Y or Z purge unit designed to protect electrical equipment in Class I hazardous areas. When connected to a supply of protective gas and utilized in conjunction with a Model PV-2 spark-arresting purge vent, the Model YZ102 will supply, regulate and monitor the protective gas supply to a protected electrical enclosure and accomplish purging of the protected enclosure in an expedited manner. The maximum enclosure volume is 15 cubic feet, and the unit has three mounting options: universal, vertical and horizontal. The unit has an operating temperature range of 20 degrees below zero to 120 degrees F. **844-787-4348; www.purgeit.com.**



ClearSpan Structures HD I-beam building

The new HD I-beam building from ClearSpan Structures is a combination of the sturdy I-beam frame and strong armor shield cover. As one of ClearSpan's most versatile buildings, the HD I-beam can be built to any size



and customized to live up to any industry's standards. The building is constructed using the I-beam frame, and the framing and purlins are all crafted from galvanized steel to ensure a long life and superior stability. The I-beam frame also features a 4-to-12 ratio pitched roof with a 12-foot nominal eave height and 10-foot clearance at the eave, ensuring easy and seamless movement in and around the building. **866-643-1010; www.clearspan.com.**

Vactor Ramjet truck-mounted water jetter

The new version of Vactor's Ramjet features IntuiTouch technology that delivers improved operating ease, quick accessibility to key information and greater control on jobs. IntuiTouch in-cab controls provide PTO activation at the touch of a button. Outside, operators can use the IntuiTouch ergonomic control station that features a simple, up/down adjusting control panel for all cleaning system functions. It also offers improved water plumbing, allowing for greater storage options. Other features, including the Jet Rodder water pump and Park-N-Clean technology, come standard. The Ramjet also includes a cold-weather package that separates wet and dry items and a rear hose reel with optional integral aluminum shroud for optimal performance in cooler environments. **800-627-3171; www.vactor.com. ♦**



Cretex Specialty Products hires new Northeastern regional sales manager

Cretex Specialty Products announced that Lucas Robinson has joined its management team in the position of regional sales manager. He will oversee sales and marketing elements for the company and will be working to expand product specifications and use through promotional efforts to engineers and municipalities, support for contractors, and further development of the distributor network in the Northeastern U.S. He most recently worked for a mid-Atlantic contractor in the promotion and sales of drain lining services.

Radiodetection announces collaboration with Sensors & Software

Radiodetection announced the expansion of its utility-locating offering to include Sensors & Software's LMX range of ground-penetrating radar systems in a new collaboration that utilizes the strengths of both companies. The LMX range of ground-penetrating radar will be available exclusively through Radiodetection in the U.S.

VMAC named one of Canada's Best Managed Companies

VMAC announced it has been named one of Canada's Best Managed Companies for the second year in a row. The 2020 Canada's Best Managed Companies program recognizes the country's leading private businesses demonstrating strong strategy and capability to foster long-term success and sustainable global growth.

SAERTEX multiCom to expand operations in North Carolina

SAERTEX multiCom plans to invest more than \$20 million in a new manufacturing and warehouse facility near its current location in Huntersville, North Carolina. The expansion will retain 34 existing positions and allow the company to add 45 new jobs over the next five years. SAERTEX multiCom has been operating in Mecklenburg County since 2009.

Tnemec names Keilbey director of sales

Tnemec named Scott Keilbey director of sales, water tank market. In his new position, Keilbey will assist Tnemec customers and representatives working within the water storage industry. Prior to his current position, he served as a Tnemec representative in Kansas City and western Missouri. Before this, he held various positions throughout the company, including plant employee, director of sales and national sales manager.



Scott Keilbey

SEPEX promotes Donegia to product manager

SEPEX announced the promotion of Josh Donegia to product manager. He joined SEPEX more than three years ago as a sales and marketing analyst. Donegia will be working on new product development activities, product launches, company product training, product messaging, pricing and market intelligence.



Josh Donegia

Asahi/America expands building information modeling and CAD library files

Asahi/America has expanded its building information modeling library on its website. The library now contains CAD files for the company's Air-Pro compressed air piping, Asahitec PP-RCT commercial HVAC and plumbing piping, Proline single wall industrial piping and Purad ultra-high-purity PVDF piping systems, in addition to its manual valves. CAD files can be downloaded through the company's online catalog at cad.asahi-america.com. ♦

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PEOPLE/AWARDS

Wayne Everhart was hired as the streets and stormwater director for the city of Plant City (Florida).

Sherwin-Williams Protective & Marine won the Charles G. Munger Award — one of the Society for Protective Coatings' Structure Awards — for the Mesa Del Sol 2 million-gallon composite elevated tank in Albuquerque, New Mexico. The honor recognizes outstanding achievement in an industrial or commercial coatings project demonstrating longevity of the original coating.

Steve King was hired as the Public Works director for the city of Port Townsend (Washington).

James Chisholm announced he will retire as city manager for the city of Daytona Beach (Florida) in March 2021 after having served in that capacity since August 2004. Among his many achievements were creating parks to collect additional stormwater to alleviate neighborhood flooding and initiating the Bennett Swamp Rehydration and Conservation Project, which redirects and disperses up to 6 million gpd of reclaimed water.

The city of **Deerfield Beach** (Florida) received the American Public Works Association's Stormwater Project of the Year award for the Kingfisher Canal Outfall Treatment Structure Project.

Dave Angel of Elevated Mountain Distilling in Maggie Valley (North Carolina) received the Big Creek Award for Partner of the Year from the Haywood Waterways Association. He donated 10 asphalt parking spaces adjacent to Elevated Park to be removed so a stormwater collection and treatment device could be built. ♦

CALENDAR

July 12-15

American Society of Agricultural and Biological Engineers Annual International Meeting, CHI Health Center, Omaha, Nebraska. Visit www.asabe.org.

Aug. 3-5

Florida Rural Water Association Annual Conference, Hilton Daytona Beach, Daytona Beach, Florida. Visit www.frwa.net.

Aug. 9-12

American Society of Civil Engineers Pipelines Conference, San Antonio Marriott Rivercenter, San Antonio. Visit www.asce.org.

Aug. 10-13

National Association of Flood and Stormwater Management Agencies Annual Meeting, Stein Eriksen Lodge Deer Valley, Park City, Utah. Visit www.nafsm.org.

Aug. 17-19

StormCon, Washington State Convention Center, Seattle. Visit www.stormcon.com.

Aug. 30-Sept. 2

American Public Works Association Public Works Expo (PWX 2020), Ernest N. Morial Convention Center, New Orleans. Visit www.apwa.net.

Sept. 14-16

National Rural Water Association WaterPro Conference, Phoenix. Visit www.nrwa.org.

Sept. 30-Oct. 1

Southern Nevada Water Authority WaterSmart Innovations Conference and Exposition, South Point Hotel and Conference Center, Las Vegas. Visit www.watersmartinnovations.com.

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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