

A Healthy Dose of Safety in Seattle

SEATTLE'S INSPECTORS DEMONSTRATE THEIR COMMITMENT TO PLUMBING INFRASTRUCTURE, PUBLIC HEALTH AND THE ENVIRONMENT

Story by **Patty Harder**

The City of Seattle is nestled between two bodies of water, Puget Sound and Lake Washington, and two majestic mountain ranges, the Olympics and the Cascades. It is the largest city in Washington state and home to one of the 10 busiest seaports in the nation. With lush evergreen forests and rich natural resources, Seattle is appropriately referred to as the Emerald City.

A top priority among the City's leaders and activists is protecting the waters of the state that provide year-round recreation for residents – and life-sustaining habitats for the varied aquatic life and wildlife. A leading force in this initiative is the City's plumbing and gas piping inspections program, which is part of the Community Environmental Health (CEH) section of the Environmental Health (EH) division within the public health department, Public Health – Seattle & King County (PHSKC).

PHSKC is the 10th largest metropolitan health department in the United States, with 1,900 employees and an annual operating budget of \$296 million. The department serves a residential population of 1.8 million people, who speak more than 50 different languages. According to Chief Plumbing Inspector Dave Cantrell, Seattle is the only jurisdiction in the entire state where plumbing and gas piping inspections are part of the health department; in every other jurisdiction, this service is part of the building department.

Historically, Seattle has always had its own health department. In the mid-1960s, however, Seattle and King County combined forces to create a single health department for the entire county. As a result, plumbing inspections for unincorporated areas of King County became the responsibility of CEH.

Today, the section's plumbing and gas piping inspections program serves a sprawling jurisdiction covering 2,134 square miles, which is nearly twice as large as the average U.S. county. With just 10 plumbing inspectors in the field, the large service area is broken down into districts, which allows the lean team to divide and conquer. Still, it's not uncommon for a single inspector to travel more than a hundred miles a day to complete their scheduled tasks.

The section also has two senior plumbing inspectors, Mark Fallgatter, who is just starting his 12th year as an inspector, and Steve Nastruz, a 14-year plumbing inspector veteran and active member of the IAPMO Board of Directors, and six administrative support personnel who serve all of CEH, including the wastewater and drinking water programs. Fallgatter and Nastruz perform plan reviews and high-level customer service, and handle unforeseen issues that arise. This allows Cantrell to take one step back from the day-to-day operations to focus on larger issues. Most notably, how to continue ensuring the health and safety of the City's plumbing system and bodies of water amid budget cutbacks and the growing movement toward water reuse programs.



**Public
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This article is the next in an occasional series profiling the inspection and code enforcement departments in cities across the United States. If your city features unique challenges that would be of interest to our readers, please contact the editors at geoff.bilau@iapmo.org or jeff.ortiz@iapmo.org.





Above: Back row (left to right) Randall Bray, Tracy Belvill, Emmett Williams, Les Dorris, Keith Nicholson, Michael Buet, Rick Lewis and Dave Cantrell. Front row: Tom Haynes, Mark Fallgatter and Steve Nastruz. Not pictured: Larry Callahan and Dan Roberson.



Center picture: Inspector Keith Nicholson explains project information to Senior Inspector Steve Nastruz.

Right: Inspector Tom Haynes reviews a list of inspection requests.

PHOTOS BY JEFF ORTIZ



Doing More with Less

In 2007, at the height of the Seattle construction boom, Cantrell's group had 19 plumbing inspectors in the field. Since the program's only source of funding comes from plumbing and gas piping permits, when construction crashed, so did their budget. Layoffs were inevitable. "Like most cities, we are facing fewer large projects, more small inspections and an operating budget that's down by one-third," Cantrell says. CEH is evaluating its plumbing inspection fee structure to ensure that the current level of service is continued. "We're staying true to our program by asking our staff to do more with less," Cantrell adds.

That program includes plumbing and gas piping inspections for commercial and residential construction, medical gas installations and temporary food service installations at local events, such as the annual Bite of Seattle. The group also prepares informational handouts in conjunction with the Seattle and King County building departments, reviews line drawings for property and business owners and participates in occasional home improvement workshops. In addition, Cantrell and Nastruz spend a significant amount of time shaping the plumbing code regulations — at the state and national levels — and sharing what they know with industry and trade organizations throughout the area.

While they do have a lot on their plate, it's all in a day's work for the current CEH inspection staff, which represent approximately 430 years of combined plumbing experience, including 180 years of inspection experience. Every CEH inspector has extensive plumbing knowledge. "A prerequisite for employment is that you need to be a licensed journeyman plumber before you can be an inspector, which isn't the case in all jurisdictions across the state," Nastruz explains, "We all have hands-on experience in the field, which is a unique asset that we bring to the health department."

Cutting the Fat, Grease and Oil

After spending 18 years in another jurisdiction's building department, Cantrell appreciates the value of performing plumbing reviews and inspections as part of the health department. Using a new restaurant to illustrate his point, Cantrell explains how

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 Keep Fats, Oil and Grease out of your drain to prevent sewer backups in your home!

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Seattle Public Utilities

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Seattle Public Utilities' F.O.G. campaign ad.

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CEH works in concert with the Food Protection Program, which is also part of the EH division of PHSKC, to not only ensure that a new food service establishment has safe food handling measures in place, but that it also approaches safety from a plumbing standpoint.

“This gives us a wonderful opportunity to address things like backflow prevention, grease mitigation and fixture drainage connections early, from both a health code and plumbing code perspective,” Cantrell explains. This eliminates the health/building code clashes that can occur when plumbing inspections are performed by a building department that is not part of the local health department. Better communication between Food Protection and CEH results in better service for the customer by getting things right the first time, which saves the food service establishment time and money. It saves the plumbing inspection program time and money, too, by reducing the number of correction write-ups and re-inspections needed to serve the customer.

Speaking of restaurants, it’s important to note that CEH also works in concert with Seattle Public Utilities (SPU) to mitigate the impact of commercial kitchen grease on the City’s plumbing infrastructure. “Grease is one of the primary causes of blockages in our pipes,”



Left: Inspector Tracy Belvill performs a plan review process.



Inspector Emmett Williams finds an address location and plans his inspection routes.

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Top: Panoramic view of downtown Seattle from atop of the Space Needle. The downtown area is small area in comparison to the hundreds of miles the inspectors need to cover.

Above: One of the many Toyota Prius used by Public Health, clearly identified by their new logo.

PHOTOS BY JEFF ORTIZ

states Frank McDonald, SPU's manager of the Drainage & Wastewater Asset Managers group. "If we can remove it at the source, there is less potential for sewage backup into someone's home or onto the street."

Restaurants are required to separate grease from wastewater by installing appropriate grease interceptors, which are regulated by the plumbing inspections program. "We have an excellent relationship with CEH because they perform the plumbing review," explains Julie Howell, SPU's Pollution Planning Program coordinator and program planner for the fats, oils and grease (FOG) program.

"The plumbing inspectors help our whole program by ensuring that the grease interceptors match the needs of a particular restaurant."

But managing grease isn't the only issue that CEH and SPU have in common. Both groups also share a commitment to protecting Seattle's state waters.

Collaboration for a Common Cause

Protecting Seattle's receiving waters takes a collaborative effort by a number of different departments and agencies. According to Brian Robinson, an environmental compliance inspector on SPU's Source Control and Monitoring Team, one-third of the sewer system fully separates stormwater from sanitary wastewater, one-third partially combines sanitary wastewater and stormwater in one pipe and the remaining one-third fully combines sanitary water and stormwater in one pipe. In every case, stormwater management is critical for the health of Seattle's water bodies.

"Where the system is combined, we are working to reduce stormwater contributions to combined sewer overflows," Robinson says. "In the separated system, our concern is keeping stormwater clean by preventing cross-connections."

The City of Seattle’s building department, the Department of Planning and Development (DPD), plays a role in stormwater management, as well. DPD recently adopted a new stormwater code for most new construction that mandates the use of green stormwater infrastructure that utilizes low impact development (LID) practices. As a result, the department is getting more inquiries about rainwater harvesting and graywater reuse programs, which takes us full circle – back to CEH.

“When our applicants want to use a rainwater harvesting system to meet some of their building code stormwater requirements, we refer them to PHSKC for the specifics because the actual permitting for those systems occurs within the plumbing inspections program,” explains Sherell Ehlers, site development supervisor for the DPD.

In a city that’s known for its measurable rainfall, the practice of capturing and reusing this natural resource is growing. While the need to conserve water isn’t as great in Washington as it is in dryer states, “In Seattle,” Fallgatter states, “it’s just the right thing to do.” Plus, energy savings are realized through water conservation. That’s why Cantrell and crew are working hard to educate — and to regulate!

A Conduit for Code Change

The State of Washington has adopted the Uniform Plumbing Code, published by IAPMO, for plumbing, and the International Code Council (ICC) I-Codes for building, mechanical, fire and so forth. CEH is actively involved with both organizations. “Years ago we decided that it was very important, from a public health aspect, to be involved in plumbing code development,” Cantrell states. “Although staying involved is hard work, it allows us to help steer the codes in a safe direction while giving us the expert advantage to deal with the changes once they show up in state law.”

Having this in-depth code knowledge also allows the group to take a proactive approach to educating its customers, and has made CEH the go-to source for cutting edge inspection advice. “Dave and Steve are recognized experts in our industry, so people from other jurisdictions routinely call us to see where we stand on current issues,” Fallgatter explains.



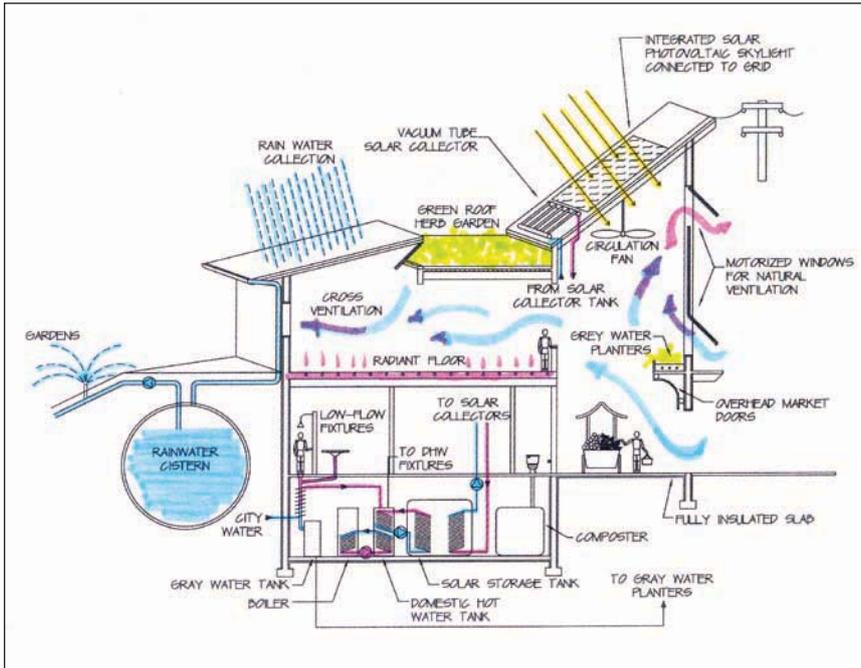
Above: Early construction of the 21 Acres building.

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Left/Below: Architect renderings of the 21 Acres project

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“Water reuse is a great example. Since this is a relatively new situation, other plumbing inspection departments might ask for our input on how to handle it. It’s rewarding to have this level of knowledge in our department.”

Significant water reuse changes are on the way from the 2009 Uniform Plumbing Code and CEH has been an active participant in the creation of state-level amendments and in the support of other jurisdictions that don’t have the same opportunity to get involved. “In many ways, we are a conduit for adopting change and establishing code consistency at a statewide level,” Cantrell adds.

Along the lines of change, CEH isn’t Seattle’s only leader. The city itself is also a proven leader of environmental change.

The Emerald City Takes the LEED®

In February 2000, Seattle became the first city in the nation to formally adopt a Sustainable Building Policy mandating that all new City-funded projects and renovations with more than 5,000 square feet of occupied space achieve a LEED Silver certified rating. The City has 38 projects targeted for LEED certification. Among the completed projects are Seattle City Hall and the Seattle Central Library. Officials estimate that by 2013 Seattle will become one of the largest single owners of LEED facilities in the world (<http://www.seattle.gov/dpd/GreenBuilding/CapitalProjects/SeattlesPolicy/default.asp>).

Rainwater harvesting plays a big role in the City’s green initiative by contributing to LEED certification and reducing the demand on city potable water systems, sewer infrastructure and stormwater retention systems. An added benefit of rainwater harvesting is the reduction of pollutants released into the area’s receiving waters during combined sewer overflows. The City estimates that for every 100 cubic feet (748 gallons) of potable water that is saved per year, the 10-year payback will be more than \$125. Over 25 years, the savings soar in excess of \$500.

Touring the Town

With sustainable construction and rainwater harvesting in mind, Cantrell, Nastruz and Fallgatter arranged a multi-site tour of several



Top: Overview of 21 Acres sustainable living processes and function.

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Above: 21 Acres manager discusses the project with Dave Cantrell.

Right: Site review with Dave and Mark.

PHOTOS BY JEFF ORTIZ





green projects so we could see some of these measures in action. After a meet-and-greet photo session at their downtown Seattle office, we hit the road. On our agenda was a sustainable community farm, a City fire station, the new headquarters of the Bill & Melinda Gates Foundation and a compressed natural gas (CGN) fueling station. To put the vast reach of the plumbing inspectors' jurisdiction in perspective, our tour began in a northern area of unincorporated King County before taking us through the city and ending in the south end of Seattle. Time-wise, we did almost as much driving as touring!

21 ACRES

Our first stop was 21 Acres, a non-profit organization and community farm founded in 1999 and dedicated to cultivating, demonstrating and advancing systems that support sustainable agriculture. Construction is underway on the new 21 Acres Center for Local Food and Sustainable Living in Woodinville, Wash. The Center will serve as an educational facility with classrooms, a commercial-grade teaching kitchen and a small farmer's market. The building itself will demonstrate, by example, how sustainable design and construction contributes to environmental stewardship by conserving energy, water and resources (www.21acres.org). The organization's goal is to achieve LEED Platinum certification for the new Center. Sustainable elements of the project include:

- Composting toilets
- On-site graywater treatment



Piping for the natural ventilation system at 21 Acres.

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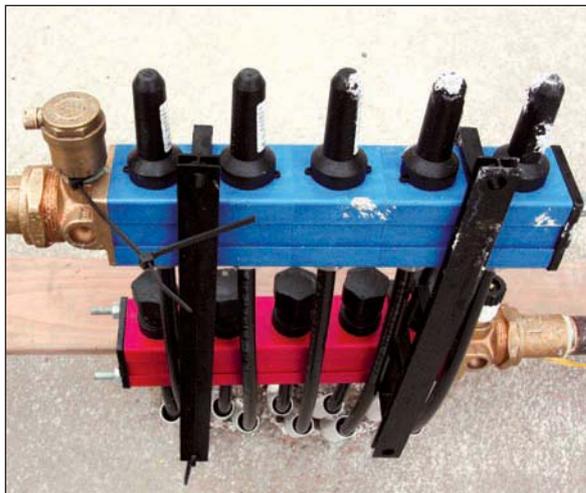


Above: Graywater return lines.

Right: Manifold for radiant heating system.

Light-weight APEX block is used primarily for the exterior perimeter walls.

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- Geothermal hot water and radiant flooring
- A green roof with some solar roof panels
- Small-scale rainwater harvesting
- A hybrid natural/mechanical ventilation system
- On-site stormwater management

Since construction is still at the early stage, many of the 21 Acres green features weren't yet in place. But we did get a look at the APEX Block building components. It's amazing how such a lightweight material is transformed into an incredibly strong and energy efficient building envelope.



Above: The new "green" built Fire Station 39 is located in Northeast Seattle.

Left: Pump station for rainwater distribution to water closet, urinal flush-ometers and hose bibs.

Below: Specific labeling required for harvested rain distribution.

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FIRE STATION 39

The next stop on our tour was Fire Station 39, a one-engine company located in the Lake City neighborhood of north Seattle. The existing station, built in 1949, no longer met safety and operational standards and a new station was constructed behind the original building as part of a nine-year program to upgrade, renovate or replace 32 neighborhood fire stations. The new, three-bay station incorporates a rainwater harvesting system to capture roof drainage for flushing toilets, watering flowerbeds and washing vehicles.





Above: Cascading water feature for roof storm drainage going to rain catchment chamber.

Top right: Hose bib supplying rain water is labeled and use of keyless hose bib.

Right: Identification in toilet room for use of rainwater.

PHOTOS BY JEFF ORTIZ



Interestingly, neighborhood residents have visual access to the station's rainwater capturing apparatus, which is designed to resemble an artistic sculpture and is positioned on the public sidewalk side of the building.

BILL & MELINDA GATES FOUNDATION

After leaving north Seattle, we headed downtown to the very active construction site for the new Bill & Melinda Gates Foundation headquarters, which is scheduled for completion in spring 2011. Located just east of the Seattle Center, the 12-acre, three-building campus will be built in two phases. After making our way through the secured gate, we donned hard hats and safety vests and followed Plumbing General Foreman Charlie Dean of McKinstry Co. on a green plumbing and mechanical tour.

First, Dean led us into an immense, partially finished basement area to view the holding tank for the campus' rainwater harvesting system. It took several moments to realize that not only were we viewing the tank — we were standing in it! Although we walked through doors to enter the tank, those doors will soon be sealed to create a fully contained reservoir capable of storing nearly one million gallons of rainwater. Dean also showed us the complex plumbing and mechanical room that will be used to control the rainwater distribution.





Another interesting, sustainable, water-based feature of the campus is the thermal energy storage system. To save energy, the system will cool water at night in a deep underground reservoir with about 600,000 gallons of storage space. During the day, the cooled water will be circulated for climate control, resulting in a reduced need for power during peak use.

According to the Bill & Melinda Gates Foundation Website (www.gatesfoundation.org), “The new campus was designed and is being constructed according to Seattle’s policy for sustainable construction.” The organization is seeking LEED Gold certification for its new headquarters, which also includes more than half an acre of living roofs and features strategic use of natural light.



Top: Bill and Melinda Gates Foundation jobsite as seen from the Space Needle.

Middle left: Mark and Dave examine an area of the rain retention wall that awaits completion.

Above: Huge retention vault being prepared with sealant compounds.

Left: Steve Nastruz inspects the primary rainwater settling chamber.

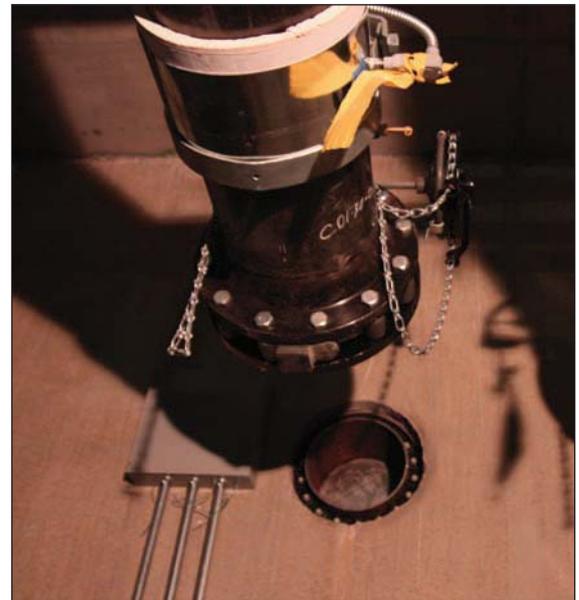
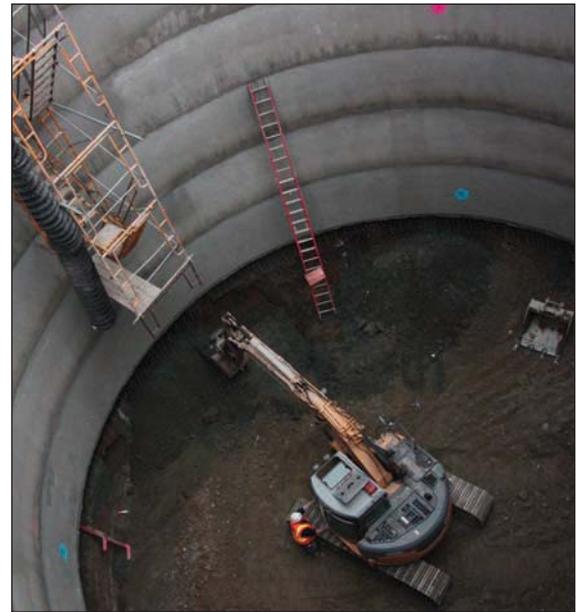
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Right: Elevated cold water lines snake through many corridors.

Far Right: 80 feet deep and growing hole for geothermal extraction.

Far right bottom: Geothermal entry line.

Below: Distribution of rain water to flushometers



Right: Vortex skimmer for storm water flow to retention vault.

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A project of this magnitude provides a much-needed boost to the City's economy, while raising the bar for sustainable construction. "We have already conducted 18 inspections at the site," Cantrell says, "and that doesn't include the time we've spent on plan reviews and consultations with the designers. We've only touched the tip of the iceberg on this project."

WASTE MANAGEMENT OF SEATTLE

Our final stop was the south Seattle headquarters of Waste Management of Seattle. In January 2009, Waste Management of Seattle broke ground on its new CNG fueling station and unveiled the region's most environmentally advanced solid waste collection trucks fueled by CNG, which will



dramatically lower greenhouse gas emissions. Within five years, all 180-collection trucks in Waste Management's Seattle-based fleet will be fueled by CNG. This will provide significant environmental, public health and community benefits to our region.

CNG installations are reviewed and inspected collaboratively by CEH and the Seattle Fire Department. Along with the high pressures and intricate design involved with these systems, there are specific requirements for things like system testing, the location of operating and emergency controls, cathodic protection (CP) and seismic bracing. Like the other conservation and sustainable construction measures affecting more and more plumbing installations, CNG is another



Top left: Vehicle connection for CNG fueling station.

Lower left: Mark and Steve examine quick-disconnect hose components.

Above: Steve takes a close look at a pressure guage.

Left: Auxiliary power generators for the CNG system.

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Top: Compressors and Dryer for CNG facility.

Above: Seattle's waste management contributes to the green cause by using clean CNG for fuel.

PHOTOS BY JEFF ORTIZ

emerging technology that the CEH plumbing inspectors had never encountered a few short years ago. Understandably, with the advancements in the plumbing, fuel gas and sustainable construction industries and codes, CEH staff work hard to meet the needs of Seattle and King County through continued education and on-going evaluation of their permit and inspection processes and procedures.

A Dedicated Inspection Team

After spending the day with Cantrell, Nastruz and Fallgatter, there's no doubt they lead a team of inspectors who are passionate about plumbing, public health and the environment. (They even ride the bus to work when

possible.) And it certainly seems like the team's work is never done. In fact, back at the office, another initiative is in the works: a shift toward paperless permit applications and wireless plumbing inspections.

By mid-2010, a new online permitting process should be up-and-running. The field inspectors, who are already equipped with notebook computers, are looking forward to implementing an electronic workflow solution that will increase productivity and further improve customer service. And until the economy picks up, the Community Environmental Health section will continue doing more with less. Now that's dedication! 📱

Special thanks to the following people for contributing their time and expertise to this story:

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- *Dave Cantrell, chief plumbing inspector*
- *Steve Nastruz, senior plumbing inspector*
- *Mark Fallgatter, senior plumbing inspector*

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- *Julie Howell, Pollution Planning Program coordinator*
- *Brian Robinson, Environmental Compliance inspector*

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