

## Representing Vermont's Water and Wastewater Systems in Washington, DC

by Liz Royer, Executive Director

Between the State of the Union address, Iowa Caucuses and the impeachment vote, the 2020 Rural Water Rally was a busy week in DC. Despite those barriers, we ended up having very productive conversations at all three Vermont offices about funding requests, PFAS regulations, our apprenticeship program, and more.

Along with myself, NRWA Director/VRWA board member Jon Thornton represented Bradford Water & Sewer and new VRWA board member John Lazelle represented the Town of Wilmington.

Our primary task was to thank Senator Leahy, Senator Sanders, and Representative Welch for their ongoing support of Rural Water programs. We presented FY2021 Appropriations Requests and emphasized the types of training and technical assistance that each program allows us to offer. We were proud to highlight some of our 2019 accomplishments:

- Hosted 136 training sessions for 1559 individuals
- Provided onsite assistance to 98 drinking water systems
- Provided onsite assistance to 91 wastewater systems
- Wrote 5 new source water protection plans and completed 13 plan updates

*Continued on page 11*

## Richmond Hires Vermont's First Wastewater Apprentice



by Paula Jackson,  
Apprenticeship Program  
Coordinator

In November, Tyler Booska became the first-ever wastewater apprentice in Vermont when he started at the Richmond Wastewater Treatment Facility (proud VRWA system member).

"So good, so far," Tyler said of his new job. "I like that it is something new every day at the plant. We have routine in some ways, but always a new task popping up. We stay nice and busy."

Tyler is part of Vermont Rural Water's new Apprenticeship Program, launched this fall to train the next generation of water and wastewater operators. Through this program, apprentices receive two years of on-the-job training as well as classroom instruction while working at treatment plant and earning a salary.

The program aims to alleviate the worker shortage at drinking water and wastewater utilities in Vermont, which is expected to get worse as the state loses current operators to retirement.

This is the case for Richmond's current Water Resources Superintendent, Kendall Chamberlin. After 30 years in the field, Kendall is ready to start considering



*Tyler Booska checks water temperature at the Richmond Wastewater Treatment Facility.*

retirement, but doesn't want to leave the town without trained employees to run the water and wastewater systems.

"The work we do is, simply, the foundation of civilization," Kendall said. "Without clean water and treated wastes, society eventually fails. That's what will keep you in the profession, knowing you are making a difference every day."

*Continued on page 8*

**Training Calendar  
page 6-7**

## Who We Are

Vermont Rural Water Association provides training and support to drinking water and wastewater systems to promote healthy communities, rivers, and lakes across Vermont.

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# Letters

## Letter from the Editor

We at Vermont Rural Water are excited to be making some changes to NewsLeaks. In this issue, we've combined our newsletter with our training calendar. Check out the trainings we'll be offering in April through June on page 6. We have over 30 classes scheduled for the next few months, so now is a great time to get those TCHs. You'll also find information about our Annual Conference at Lake Morey Resort in May.

And I can't wait to show you what we've got planned for the future. Keep an eye out for our summer issue—it'll be quite a surprise!



Best,  
Katherine Boyk  
*NewsLeaks Editor*

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## New Tools to Help Your Water System



by Aaron Perez,  
Water Systems Specialist

We are pleased to announce that Vermont Rural Water has purchased some new equipment in an effort to better serve our members. Our new tools include:

- **Drones** are available for a variety of uses such as inspecting the tops of tanks, surveying cross county-lines, and monitoring source protection areas in remote settings.
- A **thermal camera** is a great tool for finding deficiencies in building weatherization and can provide equipment thermal overload diagnostics.
- The **digital hydrant flow tester** is annually calibrated to provide an accurate flow test and has data logging capability.
- The new **nano down-well camera** features a much smaller camera head and an LED screen so you can inspect a well without removing the well pump.

These tools are available for use by members of Vermont Rural Water. Water Systems Specialist Paul Sestito and myself can help you make use of the drones, thermal camera, and digital hydrant flow tester. For the down-well camera, contact Source Water Specialist Diana Butler.

Our team looks forward to providing advanced support to you with our upgraded equipment. 💧



Our new drones can help you inspect places that aren't easily accessible. Photo credit: Marco Verch, Flickr

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# Yankee Ingenuity

This column details unique solutions to problems large and small invented by Vermont's water and wastewater operations specialists. Below are several clever money-saving, stress-reducing hacks to make life at your second home—the treatment plant—a little bit easier.



by Wayne Graham,  
Wastewater Specialist

## Well, Chute

Handling screenings from bar racks and screens is anything but glamorous. (I tell new operators in class if they only learn one thing from me it's to keep your mouth shut when handling this material!) Leave it to the crew at the St. Johnsbury WWTF (proud VRWA system member) to find a cool way to transport screenings. Bagged screenings from their auto bar screen are dumped from a cart into a chute that leads directly to a dumpster. The chute is even adjustable with a permanently mounted winch. Makes a dirty job more bearable and also safer by reducing handling of the heavy bags of screenings.



The chute delivers bags of screenings directly to the waiting dumpster below.

## Ice, Ice Baby

Anyone who operates a rectangular clarifier in Vermont is not new to ice and freezing issues with the chain drives. Operators at the Rutland City WWTF found a solution that works for them. When freezing temperatures are in the forecast, they use a hand pump sprayer to apply a product called Liquid Heat, a conveyor belt deicer/ice preventer, to the clarifier chains. They say it doesn't take much and it lasts for a long time. I am sure operators in Vermont can find more uses for Liquid Heat around their facilities. The label on Liquid Heat says it is non-hazardous and EPA-approved.



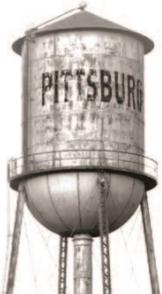
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Bethel's quick-response trailer is stocked with essentials so staff have everything they need to respond to an emergency.

## Water 9-1-1

The ever-inventive Tim Mills of the Bethel Water/Wastewater Department (proud VRWA system member) has put together a Quick-Response Trailer to get a jump on water line breaks, sewer backups, etc. Included on the trailer are sign package/traffic control equipment, trench box, trench box ladder, trench dewatering pump/hoses, portable generator, cement mixer, curb stop wrenches, gate valve wrenches, pipe, pipe saw, fittings, and tools. This trailer allows the small staff to quickly respond to emergencies and stay on the job until it's complete. Way to be prepared, Tim!

## Put that in your pipe and smoke it.

As many of you may have noticed, I do a lot of smoke testing on wastewater collection systems. It's a great method for finding inflow/infiltration and even illicit discharges. Vermont Rural Water's smoke testing equipment is designed for accessing collection systems via manholes. Occasionally we need to apply smoke to a single pipe or the vent system of a house to find troublesome plumbing issues or to trace out a line. I rigged up a leaf blower that attaches directly to a pipe or roof vent. I can apply a sewer smoke candle to the air inlet of the leaf blower. Works awesome!💧



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|------------------------------------|---|----------------------|------------------------------------|--|
| Tue, April 7<br>9 am - 12:30 pm    | Hydrants, Valves, and Meters                                  | 3 <b>W</b>           | \$18 / \$36                        | 3091 Cold River Rd,<br>Rutland         |
| Wed, April 8<br>9 am - 12:30 pm    | Understanding the PFAS Rule<br>and Sampling Requirements      | 3 <b>W</b>           | \$18 / \$36                        | 43 Bombardier Rd,<br>Milton            |
| Wed, April 8<br>9 am - 1:15 pm     | Discharges from Breweries and<br>Food Industries to Your WWTF | 4 <b>WW</b>          | \$24 / \$48                        | 20 Susie Wilson Rd,<br>Essex Junction  |
| April 8, 9, 14,<br>15; 9 am - 2 pm | Small Systems Class 2 Water<br>Operator Certification Course  | 18 <b>W</b>          | \$108 / \$216<br>textbook add \$55 | 171 Bridge St,<br>White River Junction |
| Fri, April 10<br>9 am - 12:30 pm   | Basic Math for Water and<br>Wastewater Operators              | 3 <b>W</b> <b>WW</b> | \$18 / \$36                        | 20 Susie Wilson Rd,<br>Essex Junction  |
| April 15, 16,<br>22, 23; 9 - 2     | Small Systems Class 2 Water<br>Operator Certification Course  | 18 <b>W</b>          | \$108 / \$216<br>textbook add \$55 | 783 Dog River Rd,<br>Montpelier        |
| Fri, April 24<br>9 am - 1:15 pm    | Discharges from Breweries and<br>Food Industries to your WWTF | 4 <b>WW</b>          | \$24 / \$48                        | 171 Bridge St,<br>White River Junction |
| Tue, April 28<br>9 am - 12:30 pm   | Updating Your Source<br>Protection Plan                       | 3 <b>W</b>           | \$18 / \$36                        | 190 Junction Rd,<br>Berlin**           |
| Wed, April 29<br>9 am - 12:30 pm   | Chemical Feed Pumps   | 3 <b>W</b>           | \$18 / \$36                        | 67 Merchants Row,<br>Rutland           |
| Wed, April 29<br>8:30 - 3:30       | Biological Nutrient Removal                                   | 6 <b>WW</b>          | \$45 / \$90                        | 190 Junction Rd,<br>Berlin**           |
| Thur, April 30<br>8:30 - 3:30      | Wastewater Odor Production<br>and Control                     | 6 <b>WW</b>          | \$45 / \$90                        | 190 Junction Rd,<br>Berlin**           |
| Wed, May 6<br>1 pm - 4:30 pm       | Emergency Response Planning                                   | 3 <b>W</b> <b>WW</b> | \$18 / \$36                        | Lake Morey Resort,<br>Fairlee          |
| Wed, May 13<br>9 am - 12:30 pm     | Intro to Surface Water<br>Treatment                           | 3 <b>W</b>           | \$18 / \$36                        | 78 Bowen Rd,<br>Bennington             |
| Wed, May 13<br>9 am - 12:30 pm     | Optimize Your Water and<br>Wastewater Pump Stations           | 3 <b>W</b> <b>WW</b> | \$18 / \$36                        | 6041 Main St,<br>Manchester Center     |
| Thurs, May 14<br>9 am - 2 pm       | Understanding Your Motor<br>Control Panels                    | 4 <b>W</b> <b>WW</b> | \$24 / \$48                        | 6041 Main St,<br>Manchester Center     |
| Thurs, May 14<br>9 am - 12:30 pm   | Basic Math for Water and<br>Wastewater Operators              | 3 <b>W</b> <b>WW</b> | \$18 / \$36                        | 783 Dog River Rd,<br>Montpelier        |

\*TCH = Training Contact Hours

**W** = Approved for Water Credit

**WW** = Approved for Wastewater Credit

\*\*The ANR Annex is near the Montpelier WWTF

| <b>Date</b>                      | <b>Course</b>   | <b>TCHs*</b>         | <b>Cost</b><br>(Member/Non) | <b>Location</b>                        |
|----------------------------------|---|----------------------|-----------------------------|--|
| Wed, May 27<br>9 am - 2 pm       | How to Prepare for a Sanitary Survey                  | 4 <b>W</b>           | \$24 / \$48                 | 78 Bowen Rd,<br>Bennington             |
| Wed, May 27<br>9 am - 12:30 pm   | Optimize Your Water and Wastewater Pump Stations      | 3 <b>W</b> <b>WW</b> | \$18 / \$36                 | 190 Junction Rd,<br>Berlin**           |
| Thurs, May 28<br>9 am - 2 pm     | Understanding Your Motor Control Panels               | 4 <b>W</b> <b>WW</b> | \$24 / \$48                 | 190 Junction Rd,<br>Berlin**           |
| Thurs, May 28<br>9 am - 12:30 pm | Metering in the 21 <sup>st</sup> Century              | 3 <b>W</b>           | \$18 / \$36                 | 783 Dog River Rd,<br>Montpelier        |
| Thurs, June 4<br>9 am - 12:30 pm | Understanding the PFAS Rule and Sampling Requirements | 3 <b>W</b>           | \$18 / \$36                 | 130 River St,<br>Bennington            |
| Thurs, June 4<br>8:30 am - 1 pm  | How to Handle Media - In Good Times and in Bad        | 4 <b>W</b> <b>WW</b> | \$24 / \$48                 | 171 Bridge St,<br>White River Junction |
| Tue, June 9<br>8:30 - 3:30       | Comprehensive Water and Wastewater Chemistry          | 6 <b>W</b> <b>WW</b> | \$36 / \$72                 | 344 15 W,<br>Hyde Park                 |
| Wed, June 10<br>9 am - 12:30 pm  | Intro to Surface Water Treatment                      | 3 <b>W</b>           | \$18 / \$36                 | 67 Merchants Row,<br>Rutland           |
| Wed, June 17<br>9 am - 12:30 pm  | Basic Math for Water and Wastewater Operators         | 3 <b>W</b> <b>WW</b> | \$18 / \$36                 | 94 Greens Hill Lane<br>Rutland         |
| Fri, June 19<br>9 am - 12:30 pm  | Intro to Surface Water Treatment                      | 3 <b>W</b>           | \$18 / \$36                 | 783 Dog River Rd,<br>Montpelier        |
| Wed, June 24<br>8:30 - 3:30      | Laboratory Certification Class (Day 1)                | 6 <b>WW</b>          | \$36 / \$72                 | 94 Greens Hill Lane<br>Rutland         |
| Thurs, June 25<br>8:30 - 3:30    | Laboratory Certification Class (Day 2)                | 6 <b>WW</b>          | \$36 / \$72                 | 94 Greens Hill Lane<br>Rutland         |

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**Questions?** 802-660-4988  
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# First Apprentice

*Continued from cover*

Kendall heard about the new Apprenticeship Program and was able to convince Richmond's Town Manager and Selectboard to hire an apprentice.

Tyler had been working as a welder, which frequently required traveling out of state, staying in hotels and being away from family and friends. It was time to find something more stable and closer to home in Vermont.

Tyler's stepfather, Erik Bailey, is the Superintendent of the Water Works Department in Hinesburg. He encouraged Tyler to pursue a career in the water and wastewater field.

"I really like the variety of the jobs we do every day, from collecting samples, studying, to cleaning the septage machine," Tyler said. "Well, maybe not the septage machine—but I know how important that machine is and what happens if we don't clean it!"

During his two-year apprenticeship, Tyler will learn the day-to-day operations of the wastewater treatment plant from Kendall and Richmond's two other operators, Allen Carpenter and Aaron Krymkowski. He will also receive 288 hours of classroom instruction on topics including chemistry, microbiology, environmental science, and mechanics. Tyler will then take the certification exam to become a licensed operator.

With Tyler onboard, Kendall will have a young staff of three well-trained operators able to carry on the important work of protecting public health and environmental safety in Richmond.



*From left: Aaron Krymkowski, Tyler Booska, and Alan Carpenter are prepared to take over operations the Richmond Water Resources Department.*

The water/wastewater field needs dedicated individuals like Tyler to take over for the retiring generation. New operators will need to be ready to take on the challenges of climate change and the effects it may have on our water resources.

Vermont Rural Water's apprenticeship program has signed two more apprentices with wastewater systems in South Burlington and Springfield.

To all the retiring water and wastewater operators in Vermont, thank you for your years of dedication to ensuring Vermonters have safe water to drink and that our lakes and rivers stay clean and beautiful. 💧



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# A Case Study in Diagnosing Package Plant Performance

Guest Article

By Richard Ross, PE; Miles Snyder; David Lucey  
WesTech Engineering, Inc.

*This is a follow-up to an article published in our Fall/Winter 2017 issue, which detailed a method to look at head-loss and solids removal to efficiently operate a package plant.*

## Problem

We recently visited a WTP that uses three similar packaged treatment units. While speaking about the units, the plant personnel indicated that the first unit didn't perform as well as the other two. They were not sure why the effluent quality was different, as the units were identical and received the same chemistry and flow.

## Background

The plant operates 12-18 hours per day, 7 days a week, 365 days a year. The source water comes from the local stream and is pumped directly to the plant. The plant produces 45,000–80,000 gpd which is seasonally adjusted.

The plant has one Microfloc Trident TR-210A system (consisting of two stainless steel units) that was installed in 1992. A third unit was installed in 2015. These package plants utilize a buoyant-media adsorption clarifier (AC), followed by a mixed-media gravity filter.

Two units are run at a time. Nominal flow through each tank is 350 gpm or 0.5 MGD. Each clarifier flushes and filter backwashes every 1800 minutes (30 hours), sequentially, typically on time, but also on high headloss. Filter-to-waste is run for 16 minutes. Flush and backwash waste is sent to sewer.

## Diagnosis

We discussed how to evaluate each unit's performance and decided to take turbidity samples from the raw water, water under the clarifier and on top of the filter. This would help us determine the solids removal for each step in both units.

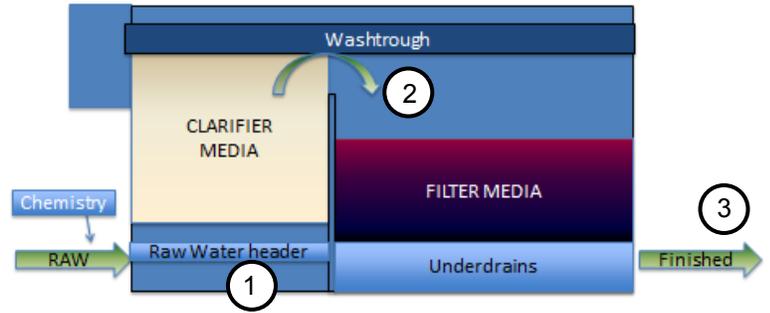
| Unit | Raw       | Under AC  | Over AC   | Finished  |
|------|-----------|-----------|-----------|-----------|
| #1   | 0.357 NTU | 0.663 NTU | 0.330 NTU | 0.095 NTU |
| #2   | 0.357 NTU | 5.03 NTU  | 0.357 NTU | 0.067 NTU |

In the #2 unit we saw a 92% reduction of solids from the AC and 81.3% solids removed across the filter. We noted that this was pretty good and showed that this unit was functioning well.

In the #1 unit we saw only a 50% reduction of solids from the AC and 71% solids removed across the filter. We had now quantified the performance of each unit and confirmed that something was indeed wrong with the #1 unit.

Fortunately, the #1 unit was nearly ready for a flush and backwash and we would be able to observe and take samples.

The AC flush washout curve appeared to be normal, though we could see that the air scour was not evenly distributed across the basin. The filter backwash washout curve looked good.



## Components of a Package Plant

A common package plant configuration is clarification followed by filtration. Monitoring three parameters (indicated by circles in the diagram above) will show how well the process is working: (1) influent turbidity is typically higher than raw water turbidity as it contains the turbidity of the raw water, chemistry additions, and any coagulated particles, and can also be referred to as coagulated turbidity; (2) settled water turbidity or inter-stage turbidity, is the turbidity out of the clarifier or onto the filter; and (3) filtered effluent water turbidity, as well as a headloss across the clarifier and filter.

Once the blower stopped for the clarifier, the filter water level was lowered and the blower started backwashing the filter, even while the clarifier was releveling and rinsing. The distribution of air looked normal and we didn't see any media craters or cracks.

## Solution

We then checked the AC media depth using a 5' piece of 14-gage wire, with a 90-degree bend 2" from the bottom. The water level in the AC compartment was lowered and the operator worked at getting the wire through the screen. You could see and feel the sharp edges of the AC media poking through the screen.

The media on one side of the trough measured about 48 inches deep and on the other side was less than 30 inches. The ideal depth of the media is 48 inches. This indicated that a lot of the media was missing and had shifted to one side. This was the reason this unit didn't perform as well as the others.

A simple addition of clarifier media would fix the problem with the unit. 💧

*This article has been abridged. Read the full article at [VT Ruralwater.org/package-plant-case-study](http://VT Ruralwater.org/package-plant-case-study)*



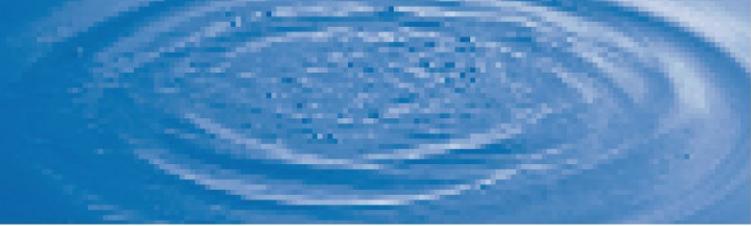
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# Lake Management Conference Focuses on Source Water



by Diana Bulter,  
Source Water Specialist

Source water was in the spotlight at the North American Lake Management Society’s annual conference in Burlington this past November. For the first time, the conference had an entire day of sessions dedicated to Drinking Water Source Protection.

Our own Executive Director, Liz Royer, opened the session with an overview of Vermont Public Drinking Water Systems as well as how we regulate and implement Source Protection.

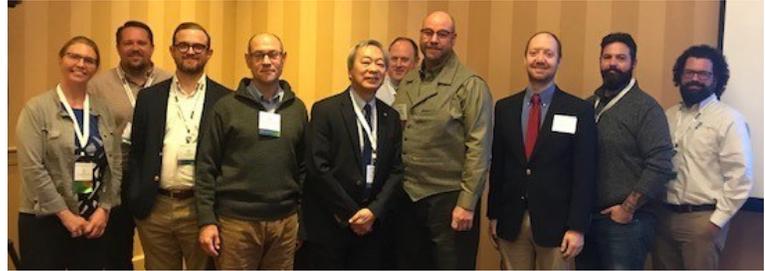
Presenters covered a range of topics, including timber harvesting in Source Protection Areas, phosphorus management at the source to control taste and odor at the tap, and using Source Protection funding for project implementation.

Participants represented a wide variety of water industry occupations from places like Arkansas, Minnesota, New Hampshire, Maryland, New York, Washington DC, and Colorado.

Joe Duncan, General Manager of the Champlain Water District (proud VRWA system member), gave a presentation about CWD’s success in protecting their surface water source in Shelburne Bay of Lake Champlain and the long-term strategies they are using in the watershed.

Adam Carpenter, Manager of Energy & Environmental Policy American Water Works Association, spoke about collaborating with the USDA on the Farm Bill to secure funding for Drinking Water Source Protection.

It was an impressive opportunity to show off Vermont’s source water protection success to over 600 attendees from all over North America. 💧



Presenters on Source Water Protection at the NALMS conference, including VRWA Executive Director Liz Royer (far left).

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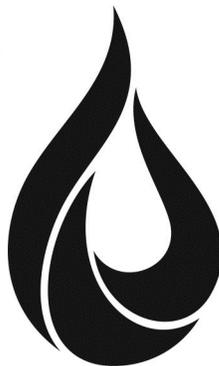
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## Washington, DC

*Continued from cover*

In addition, we discussed our new registered apprenticeship program for water and wastewater operators. We also spoke of the challenges of workforce development in a small state with very small utilities and the bigger challenge of seeking out funding sources to continue to fully support the program.

Finally, we were asked about our outreach work regarding PFAS in drinking water. We talked about the challenges of Act 21, passed by the Vermont Legislature last spring. While four public water systems are currently operating under Do Not Drink orders due to PFAS contamination, we expressed our frustration that no funding was provided to help these systems. We discussed their immediate needs of buying bottled water for their students and residents and hiring engineers to look at alternatives for providing clean, safe drinking water. In addition, we spoke about some of the long-term funding challenges and the need to focus on the chemical manufacturers as the source of the PFAS pollution.

While it was a busy week in DC, our work is never done. Vermont Rural Water will continue to advocate for our members and all of the state's water and wastewater systems at the federal, state and local levels. ♠

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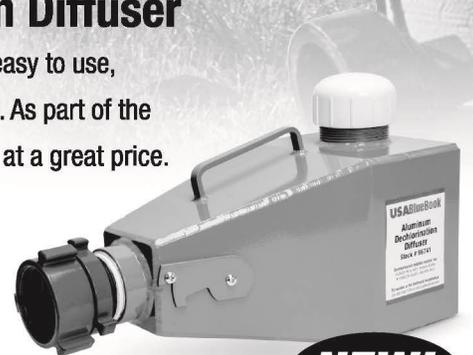
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