



## Links, Resources, Speaker Bios and Q&A

**PFAS are manufactured chemicals that do not biodegrade.** Originally formulated in the 1940s to resist grease, oil, stains, water and heat, PFAS can be found in many consumer products such as non-stick cookware, water repellent clothing, food packaging, stain resistant fabrics, cleaning products, and cosmetics, as well as in fertilizer and firefighting foam. Humans, crops, livestock and wildlife are exposed to PFAS in the air, on land and in water. Despite the recent attempts to find less-toxic formulas of PFAS and phase out older varieties, PFAS contamination continues to pose substantial risks to humans and the environment.

## Videos Links

### [Welcome](#)

Debbie Lewis

President, Garden Club of Virginia

Marie Thomas

Chairman, Conservation Awards Committee

Presentation of the 2022 Elizabeth Cabell Dugdale Award for Meritorious Achievement in Conservation: Save River Farm Committee and 2022 Conservation Educator Award: Robin Dunbar, Elizabeth River Project and The Big Water Visitor Education Center, Kiptopeke State Park

(14 mins)

### [Introduction to Per- and Polyfluoroalkyl Substances \(PFAS\)](#)

Joe DiNardo, Toxicologist, Rockbridge Conservation (15 minutes)

### [PFAS and How Does This Affect Your Health](#)

Dr. Bill Mann, The Potomac Aquifer Recharge Oversight Committee (22 minutes)

### [PFAS in Drinking Water](#)

Erin Ling, Sr. Extension Associate & Program Coordinator, VT BSE/VCE

Leigh-Anne Krometis, Associate Professor, VT BSE

Kathleen Hohweiler, Graduate Research Assistant, VT BSE (29 minutes)

### [Wastewater Treatment, Biosolids & PFAS](#)

Rob Hale, Professor, Dept. of Aquatic Health Science, Virginia Institute of Marine Science (26 minutes)

### [Consumer Products and PFAS](#)

Joe DiNardo, Toxicologist, Rockbridge Conservation (22 minutes)

## Our Conservation Forum 2022 Speakers



**Joe DiNardo** is a retired personal care products toxicologist, formulator and regulatory affairs professional with more than 45 years experience. DiNardo worked for Revlon and Almay. He was co-founder of Pharma Cosmetix Research, a research and technology company that consulted and developed various technologies for a range of personal care product companies, including Allergan, Elizabeth Arden, and Burt's Bees and several small independent medical professional groups. DiNardo retired in 2013 and has since pursued environmental toxicology concerns associated with various chemicals, including PFAS.

DiNardo holds a master's in toxicology from St. John's University in New York, wrote a textbook used to train estheticians along with various chapters for scientific books, published several manuscripts in the areas of sunscreen, reproductive and general toxicology, dermatology, in vivo/in vitro photobiology, comedogenicity, alpha hydroxy acid and antioxidant safety/efficacy. He also holds several domestic and international patents for various technologies. DiNardo has worked with several industry groups over the years and has served on numerous task force/committees for the personal care industry.

**Dr. Robert C. Hale's** primary research interests are environmental chemistry, biosolids, fate and availability of man-made compounds in aquatic environments.

Recent projects include identification of pollutants released via water, air and to soil following sludge (biosolids) applications and associated effects; bioavailability of sludge-associated chemicals to terrestrial and aquatic organisms; sources, analysis, fate and effects of brominated flame retardants and non-ionic detergents in the environment; consequence of plastic debris in terrestrial and aquatic environments.

Invested in educating his students on emerging environmental issues, Hale uses his passion for solving global health challenges in and beyond the classroom. He began his career as an environmental chemist at Mobil Oil. He is now a professor at VIMS. He consistently engages with industries, NGOs, and students on real-world issues. He has published more than 100 peer-reviewed articles in journals such as Environmental Science & Technology and remains one of the most frequently cited active faculty at William & Mary.



**Kathleen Hohweiler** is a second-year master's student in biological systems engineering at Virginia Tech where she is currently advised by Dr. Leigh Anne Krometis. She graduated from Towson University Honors College in Spring 2021 with a degree in geology. Kathleen plans to pursue her Ph.D. in biological systems engineering in the future.



**Leigh-Anne Krometis, Ph.D.**, is an Associate Professor and Elizabeth and James E. Turner Jr. Fellow in biological systems engineering at Virginia Tech. She has more than a decade of experience in quantifying water and wastewater infrastructure needs and human health impacts in the Central Appalachian Coalfields, with in-region projects funded by USGS, USDA, NIH, NSF, NOAA, the Virginia Environmental Endowment, the Appalachian Regional Commission and the Appalachian Research Initiative for Environmental Science.

**Erin Ling** is a Senior Water Quality Extension Associate at Virginia Tech in the Biological Engineering Department. She has a B.A. from Virginia Tech in international development and two masters degrees from Penn State in environmental pollution control and rural sociology. Currently, she coordinates the Virginia Household Water Quality Program with Virginia Cooperative Extension, which offers affordable water testing and education to Virginia's 1.6 million well and spring users and works with collaborators on applied research projects related to this program.



**William J. Mann Jr., M.D.**, spent more than 35 years in academic medicine as a gynecologic oncologist, and was active in teaching, research and clinical care for women with cancer of the reproductive organs. He is now a governor appointee to the Potomac Aquifer Recharge Oversight Committee, participated in the first working group on PFAS in 2021 and has an abiding interest in water quality and equity. He continues to study marine science at VIMS

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## 64th Annual Conservation Forum

### Question

Is any non stick cookware a problem or some of these new "green" versions OK?

Are we limiting pfas in blood by choosing organically grown food?

Is PBA(?) e.g. in plastic bags consider to be a PFAS?

For drinking water, does a granular activated carbon municipal system provide removal?

For well water systems, lead and copper pipes are a known contaminate, but are there P FAS in pvc and cpvc plastic piping?

Wells: How do you know if a Landfill is Unlined or Lined?

I live in Rockbridge County on former farmland, bordered on two sides by a stream and creek. We have a private well, which has not been tested since it was drilled in 2010. Would Virginia Tech be interested in testing our water? I would be willing to pay for basic and PFAS testing.

### Answer

VT crew isn't sure - a lot of the "green" labeled items seem to have new (short-chain) generations of PFAS (e.g. GenX and ADONA). We don't really know if they are better yet. Happy to hear from Mr. Dinardo or Dr. Mann if they know better.

It's hard to say. I actually used to work in organic certification and there are restrictions on applications of biosolids. Really a lot of the PFAS exposure regarding food has to do with food packaging, cooking (e.g. non-stick cookware).

PFBA is a PFAS. Not BPA (bisphenol A) - not a PFAS. PFAS have to have an F in them (fluorine).

There is evidence that GAC does work to remove PFAS in municipal systems if maintained correctly. But this is challenging because we aren't testing regularly for PFAS in municipal systems so we don't know what loading levels are like.

I am not sure about PFAS in plastic plumbing. I wouldn't be surprised if it's there. Lead and copper can also be present in systems that people think are mostly plastic in the connecting pieces like "sharkbites", T and check valves and the interior of faucets.

<https://www.deq.virginia.gov/land-waste/solid-hazardous-waste/solid-waste/solid-waste-facility-requirements-and-guidance>. I think the regulations requiring lining for new landfills came into effect in 1960's.

For this USGS project, we are focused only on those counties we listed: Floyd, Roanoke, Buckingham, Albemarle, and the Eastern Shore. We do have some future opportunities to test for PFAS coming up but haven't identified where yet. Thanks for your interest!

## Question

What do you recommend as the best filtration systems for private wells?

Is there any information about presence of PFAS chemicals in synthetic turf fields used for children to play. I have read some studies and admission of the industry that PFAS is needed for the extruded plastic "pretend grass."

I have had my water tested by different labs in the state and wondered if some labs are more accurate and test for more contaminants than others?

In Virginia, can a County regulate where biosolids come from that will be spread?

Are there any certifications for compost to ensure they are cleaner?

Do you know if PFAS is found in printed products such as newspapers, magazines, and books? Is it better not to use newspaper as compost if PFAS is in this product?

Dr. Hale, What is an acceptable alternative to biosolid application?

## Answer

We recommend you test the water to find out about your water quality first and then you can make an informed decision. Depends on what you are trying to remove and at what levels.

Quick google search it appears possible:  
<https://www.eenews.net/articles/our-community-has-been-deceived-turf-wars-mount-over-pfas/>

Labs do test for different contaminants but all follow standard methods so results should be very close. Here is the full list of certified labs in Virginia:  
<https://dgs.virginia.gov/globalassets/business-units/dcls/documents/environmental/acpl-report-sdwp-dw-labs-07012022.pdf>. Note our labs are not certified because we are university research labs but do follow all standard methods.

Counties have tried and failed to ban application on several occasions. In VA state regs take precedence, especially as it relates to agriculture

There is a the biosolids A, B and EQ system (for sludge)....but these do not consider PFAS. As mentioned containers are a big source, so avoiding those that use containers are a plus.

PFAS was generally used to protect paper/cardboard from moisture or oil/fat...so I do not think newspaper et al...are big sources. That being said we need to gain a better understanding of the range of products (and reasons) for using PFAS materials.

As PFAS are extremely long lived alternatives such as landfilling are likely safer, but sooner or later leaching can occur. In some respects we are "kicking the can" down the road. Careful incineration (controlling emissions) are likely as option but this can be expensive.