

It's time to end the use of PFAS in fire fighting

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Photo credit: Matthew Ames [@spyderman83.1](#) on instagram

On June 14, the Chemtool lubricant factory in Rockton, Illinois, caught fire, causing an explosion that sent black ash into the air and resulted in the evacuation of all residents within a one-mile radius. People in a two- to three-mile radius from the fire were instructed to wear masks. As the chemical fire raged, emergency responders weighed their options. Town residents weren't allowed to return to their homes until the smoke had dissipated. Fire officials raised concerns about fighting the fire with water and industrial firefighting foam, given the chemical facility's proximity to the Rock River. In a press briefing on the morning of June 15, the Rockton Fire Chief, [cautioned](#),

"If we let product go into the river, I think we'd have more of an environmental impact, and more of a nightmare than this actual fire."

Despite these concerns, Chemtool's parent company, Lubrizol Corporation, contracted industrial firefighting company US Fire Pump, which sprayed [3,200 gallons of PFAS-based firefighting](#)

[foam](#) concentrate onto the fire the same afternoon. Over the course of three hours, 74,000 gallons of water mixed with PFAS were used to extinguish the blaze. PFAS (Per- and Poly-Fluoroalkyl Substances) are highly persistent and toxic chemicals added to firefighting foams used to extinguish petroleum-based fires. They are also highly toxic to humans and wildlife. Illinois State and Federal agencies intervened to halt the operation, and US Fire Pump switched to using a PFAS-free foam.

While Rockton residents are asking questions about the lingering effects of pollution caused during the fire and emergency response, this article will more broadly explore the impact of the decision to use PFAS-based foams during the emergency response following the Chemtool explosion. The use of foams that contain PFAS in fire training and firefighting has long contaminated drinking water supplies in the US and abroad. States and federal agencies are moving to phase out the product, and safer chemical mixtures are available and effective.

[image-need to tag/credit photographer Matthew Ames @spyderman83.1 on instagram]
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On June 17 and 18, the [Illinois Environmental Protection Agency](#) (EPA) tested for PFAS in the Rock River, at the Chemtool site, and in the wastewater leaving the local sewage treatment plant. All samples were sent to Merit Laboratories in East Lansing, Michigan. The findings suggest that PFAS from the firefighting effort washed down wastewater drains at the Chemtool site, and passed from the sewage treatment plant into the Rock River. PFAS concentrations at the sewage treatment outflow were at least **50 times higher** than elsewhere in the river, at

nearly 6,000 parts per trillion. Wastewater collected and held at the site had about 15-20 times more PFAS than the river itself.

PFAS sampling of the Chemtool site and surroundings by Illinois EPA

Location	IL EPA total PFAS measurement (parts per trillion)
Chemtool site	
Wastewater collected in frac tank	1,670
Rock River	
Rockton sewage treatment plant outflow to Rock River	5,988
Rock River near Chemtool site	85 to 121
Rock River upstream from Chemtool	97 to 116



In addition to the 29 easily measured PFAS chemicals, Rock River samples contain a similar amount of unidentified PFAS precursors

The Sierra Club also tested water samples collected on June 24 from the Rock River -- both alongside the Chemtool facility and upstream -- and sent samples to Merit Laboratories for analysis. We found concentrations in the river that are similar to those measured by the Illinois EPA. However, we contracted Merit to also use the TOP Assay to measure a broader category

of PFAS precursors. This test uses chemical oxidation to measure a variety of PFAS that can break down in the environment to form the specific PFAS chemicals that we and the Illinois EPA had measured. Merit's oxidized samples showed, on average, 2.2 times more PFAS, indicating that the eventual toll to the river is greater than indicated in the Illinois EPA water tests alone.

TOP Assay for Rock River samples

Sierra Club samples	Pre-TOP PFAS measurement (parts per trillion)	Post-TOP PFAS measurement (parts per trillion)	Percent increase
Rock River near Chemtool site	87	191	119%
	81	164	102%
	79	167	111%
	78	153	142%
Rock River upstream from Chemtool	63	158	150%

The Illinois EPA has set [health advisory levels](#) for just six PFAS chemicals in groundwater: PFBS, PFHxS, PFOS, PFOA, PFNA, and PFHxA. No state or federal agency has determined safe levels of ingestion for other PFAS detected, including firefighting chemical 6:2 FTSA, which was measured at 4,400 parts per trillion in a wastewater tank, and 5,700 parts per trillion in water leaving the Rockton sewage treatment plant. This [chemical breaks down](#) into stable 5- and 6-carbon chain fluorochemicals, including PFPeA and PFHxA, which were measured in several other water samples.

The Illinois EPA hasn't clarified what PFAS contamination could mean for the health of Rock River or people downstream who depend on it for drinking water. It hasn't disclosed any additional steps it took to keep PFAS out of the wastewater system and Rock River, other than plugging the wastewater drains at the chemical factory site. The public deserves a full accounting of the amount of chemical waste that entered the sewage treatment plant, as well as all efforts made to capture and contain the chemicals, including residue that remains in drainage pipes.

Why are PFAS-based foams still used for firefighting?

There are dozens of PFAS-free firefighting foams on the market, and one was even readily available to fight the Chemtool fire. So why aren't they more widely used?

When the US military stopped using certain PFAS-based foams in about 2016, it replaced its massive stockpiles of AFFF with a new PFAS mixture [with a slightly different chemical structure](#). Congress established a phaseout for PFAS use at large airports by 2021 and for most military uses by 2024. As these deadlines approach, it isn't clear if both entities will adopt new standards in time.

Outside of federally-administered services like airports and the military, there has been no broad effort to halt the use of PFAS in firefighting nationally. Even the older foams, which have been banned in Europe for a decade, are still found today at US fire stations, oil refineries, railroads, chemical plants, and other facilities.

Illinois recently enacted a law to end [PFAS in firefighting](#), joining seven other states ([California](#), [Colorado](#), [Maine](#), [Nevada](#), [New Hampshire](#), [New York](#), and [Washington](#)). In addition to phasing out usage of these foams, eight states have initiated take-back programs to collect and dispose of PFAS stockpiles (California, Washington, Colorado, New York, [New Hampshire](#), [Connecticut](#), [Michigan](#), and [Massachusetts](#)). States are using a variety of funds to pay for collection and disposal, with some purchasing replacement PFAS-free products for use at smaller fire stations.

The Chemtool incident shows that we need additional urgent action to prevent the use of harmful chemicals like PFAS in firefighting. The chemicals washed into the Rock River will linger for decades, if not centuries, poisoning water supplies and aquatic creatures. The US EPA should take immediate steps to work with community emergency responders like fire chiefs to cease using PFAS-based foams in firefighting. It must also fully monitor, report, and ensure the cleanup of PFAS after their use.

Appendix of sampling results:

PFAS sampling disclosed to date by Illinois EPA

Location	IL EPA total PFAS measurement (parts per trillion)	IL EPA site ID	Sample date
Chemtool site			
Wastewater frac tank	1,670	Frac tank	6/18/21
Rock River			
Rockton Sewage Treatment Plant outflow to Rock River	5,988	SID POTW Effluent	6/18/21
Rock River near Chemtool site	85-121	Rock River C1, C2, C4, C5	6/17/21 and 6/19/21
Rock River upstream from Chemtool	97-116	SID A	6/17/21 and 6/19/21

Sierra Club water sampling -- PFAS measured by the TOP Assay for Rock River samples

Samples	Pre-TOP PFAS measurement (ppt)	Post-TOP PFAS measurement (ppt)	Percent increase	Sampling location	Sample date
Rock River near Chemtool site	87 81 79 78	191 164 167 153	119% 102% 111% 142%	C5 X301-12 C1 C2	6/23/21
Rock River upstream from Chemtool	63	158	150%	SID A	6/23/21