New York Law Journal

The Emerging Crisis of PFAS Exposure

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October 6, 2017

Are PFAS the next MTBE? Or, perhaps the next asbestos? Or, in the words of William Shakespeare, is it much ado about nothing? That is the question from both sides of the bar, as well as industry and the regulatory bodies. Initially, it seemed as a one-off instance of an industrial chemical release of something called PFOA, in the small, upstate, picturesque Village of Hoosick Falls. However, on the heels of the lead water contamination disaster in Flint, Mich., and an ever-aware and educated public, groundwater contaminated with per- and poly-fluoroalkyl substances (referred to as PFAS), including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), was suddenly everywhere anytime someone sampled for it.

It now appears that PFAS, including PFOA and PFOS, may make the gasoline additive MTBE (Methyl Tertiary Butyl Ether) look like a blip on the radar of toxic tort litigation. PFAS chemicals are being found in the groundwater at airports, fire training installations and military bases across the country because it was used in firefighting foam for suppressing petroleum fires (aqueous film-forming foam or AFFF). PFAS have also been found in high concentrations in soil and groundwater at plants that manufacture stain-resistant textiles and non-stick cookware. And as if that were not enough, Sen. Charles Schumer just requested the Food and Drug Administration to launch a formal investigation into the health consequences of PFAS chemicals used in fast food packaging.

In addition to the ubiquitous nature of PFAS in today's society, PFOA and PFOS have strong links to certain diseases and cancers, stay in people's blood in detectable quantities for 10 to 15 years, are being regulated in the *parts per trillion* (ppt) levels in water, and are expensive to treat and remediate due to their chemical stability and persistence in the environment, making them a prime target for toxic tort lawsuits.

Background of PFAS

PFAS are man-made, manufactured chemicals. They are never found in nature. These chemicals were, and are still being, used to make household and commercial products that resist heat and chemical reactions, repel oil, stains and grease. They are also used in the waterproofing on shoes, clothes and mattresses. PFOA was once widely used in nonstick cookware and surface coatings for stain-resistant carpets and fabric. PFOA is also added to the paper and cardboard in food packaging, such as microwave popcorn bags and fast food containers, because it keeps the food packing from sticking to the food. On the industrial front, PFOA and PFOS were used in AFFF and in many other products for the aerospace, automotive, building/construction, and electronics industries.

As useful as they are, they are, in the end, toxic. Eight major PFOA manufacturers agreed to participate in the PFOA Stewardship Program with the EPA in 2006 due to its toxic and bio-persistence. The participating companies made voluntary commitments to reduce product content and

facility emissions of PFOA and related chemicals by 95 percent, no later than 2010. All participating companies said that they met the goals of the program and the last time PFOS was manufactured was in 2002. But even still, every person in the United States has some level of PFAS in their blood because of its persistence in the environment and the human body.

In additional to discharge of AFFF for training and fires, PFAS gets into the environment from industrial facilities that make PFAS or use PFAS to make other products. It also enters the environment when released from PFAS-containing consumer products during their use and disposal. PFAS can remain in the environment, particularly in water, for many years. PFAS can move through soil and into groundwater, or be carried in the air. PFAS have even been detected in the brain tissue of polar bears in the arctic.

PFAS are readily absorbed after consumption or inhalation, and accumulate primarily in the blood stream, kidney and liver. Human studies have shown a strong correlation between increased PFOA and PFOS levels in blood and an increased risk of several health effects, including effects on the liver, the immune system, high cholesterol levels, increased risk of high blood pressure, changes in thyroid hormone, ulcerative colitis, pre-eclampsia, and kidney and testicular cancer. C8 Science Panel Probable Link Reports, C8 Science Panel (updated Jan. 4, 2017) (accessed Aug. 4, 2017). Other studies have shown that PFOA can be transferred from pregnant women to their unborn children and has been found in breast milk. Office of Water, U.S. Envtl. Prot. Agcy., Drinking Water Health Advisory for Perfluorooctanoic Acid 54 (2016). There are currently no publically available published studies on the safety of dozens of related PFAS that are being found in people's blood such as perfluorohexane sulfonate (PFHxS), perfluorononanoic acid (PFNA), perfluorobutane sulfonate (PFBuS), and perfluoroheptanoic acid (PFHpA).

Why Now?

For a brief recount on how and why this is just coming to light now, we have to go back to 1974. In that year, Congress passed the Safe Drinking Water Act (SDWA), which provided a statutory basis for federal and state regulations governing the operation of public water systems, including the permissible concentrations of contaminants in drinking water. The Safe Drinking Water Act requires cooperation between the federal and state regulatory agencies in setting contaminant limits and enforcement.

In 1996, Congress amended the Safe Drinking Water Act requiring the United States Environmental Protection Agency (USEPA) to publish a list of unregulated contaminants that are not subject to any proposed or promulgated national primary drinking water regulations every five years. The USEPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not yet have health-based standards set under the Safe Drinking Water Act.

PFOA was included on the third Contaminant Candidate List (CCL) in 2009. EPA, Drinking Water Health Advisory for Perfluorooctanoic Acid (2016). Under the SDWA, the USEPA was required to implement a monitoring program for unregulated contaminants so the USEPA included PFOA in its third Unregulated Contaminant Monitoring Rule (UCMR 3) in 2012. This required all large systems servicing more than 10,000 people, plus a statistically selected group of 800 small systems, to monitor for a one-year period between 2013 and 2015. The data indicated that PFOA was measured at or above the minimum reporting level in approximately 2 percent of public water systems nationwide.

The UCMR program also has an additional benefit to the USEPA: the health assessment of humans on exposure to unregulated chemicals and the levels of the exposure. The data is one of the primary sources of occurrence and exposure information the Agency uses to develop regulatory decisions for emerging contaminants. The USEPA then reviews contaminants that have been evaluated through

existing prioritization processes, and then further prioritizes contaminants based on other health effect studies and evaluations.

Uncertain Future of PFAS Regulation

With the eventual release of the PFOA and PFOS testing data under the UCMR 3, numerous violations of the health advisory level (400 ppt at the time) were found. Soon, it was revealed that tens of thousands of New York residents have suffered bioaccumulation of PFAS in their blood at levels much higher than the national average from contaminated groundwater in places that include the Village of Hoosick Falls, the City of Newburgh, Westhampton, Petersburgh, and Yaphank. More places certainly exist. But New York is not alone. Pennsylvania, Delaware, New Hampshire, Massachusetts, Vermont, and Colorado have all sustained impacts of residents being exposed to drinking water with high levels of PFOA and PFOS.

The USEPA currently has a Health Advisory level of 70 ppt (formerly 400 ppt, and then later 200 ppt). This level, as the name suggests, is not a legally enforceable limit. Given the USEPA's inability to set an enforceable MCL, the states have been forced to determine their own regulatory levels. For example, New Jersey's drinking advisory panel approved a 14 ppt MCL for PFOA following a decade of research on the contaminant. That enforceable limit is currently awaiting approval by the NJ Department of Environmental Protection. In late 2016, Vermont passed a 20 ppt standard for PFOA and PFOS. This standard was challenged by Saint-Gobain with three different lawsuits, which were all dismissed. Minnesota, determining that the federal health advisory level was insufficient to protect infants and small children, has imposed a 35 ppt regulatory limit.

At right is a table showing the variations in enacted and proposed regulatory levels.

State	Guideline Value (PPT)	Source	Date
Delaware	40	DNREC	2016
Maine	70	DHHS	2014
Michigan	70	DEQ	2016
Minnesota	35	MDH	2017
New Jersey	14	NJDEP	2014
New York	70	DOH	2016
Vermont	20	ANR	2016

As can be seen, barring an MCL set by by the USEPA, industry, public water suppliers, plaintiffs and defendants are all left in a state of uncertainly. The effect of no standard MCL for the public safety is far reaching. For instance, water providers are left to guess on what treatment to install, and how much is it going to cost, if they do not know what levels to treat down to. Industry is in a similar situation. How can industry set their discharge levels when what is permissible one day, may not be permissible the next. Perhaps most importantly, how is a mother supposed to know what levels of PFAS in her water is safe for her infant or unborn child. Without guidance from the agencies designed to protect the environment and public health, everyone is left to wonder: Is the water safe?

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