

## **Perfluorinated Compounds: Where Are We, Where Are We Going and When**

by Barry Steinberg

There are few environmental subjects that will generate more concern, adverse publicity, and demands for governmental action than contamination, real or alleged, of drinking water. Given the essential nature of drinking water, this statement of the obvious warrants no defense. The recent experience with lead contamination of drinking water in Flint, Michigan demonstrates public outrage and political reaction to health risks associated with drinking water contaminated with lead. The outrage over the failure of leaders and water providers is understandable, given the widely publicized, long standing, and scientifically established adverse health consequences of lead exposure, particularly exposure to drinking water in young children.

But what about contaminants for which evidence of adverse health effects is not scientifically established, knowledge about exposure is not widely available, enforceable standards do not exist, and the use of such contaminants have identified benefits? Causation of harm may not be established and, if not, it is only through correlation that suspicions about causation arise. The fundamental question is “what is the default action”? Do we wait for scientific proof before we regulate or do we impose a protective standard based on suspicion and correlation? This is the dilemma associated with what is described in legislation as “emerging contaminants.” Scientific proof of causation is not an appropriate standard in matters of public health.

Perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), two such emerging contaminants, are man-made substances in a chemical family known as perfluorinated compounds (PFCs). They are highly effective as surfactants, substances that provide a protective blanket when properly applied. Due to that characteristic, they have been used to provide the protective layer in stain-resistant carpeting, non-stick coatings on the inside of microwave popcorn bags, non-stick surfaces in cookware such as Teflon, and of greatest interest to communities associated with current and former military aviation missions, as fire-fighting foam to address aviation accidents, where they essentially smother a fire by blocking oxygen. PFOS and PFOA-containing Aqueous Fire-Fighting Foam (AFFF) has been widely used, particularly by the Air Force and the Navy, to respond to aviation fires. It is also used in commercial aviation activities. AFFF is highly effective and indisputably beneficial for its intended purpose; however, its use and the training associated with its use have resulted in runoff and migration to groundwater which is the source of public and private drinking water supplies. The wide spread non-aviation uses described above demonstrate that the military should not be regarded as the sole source.

Currently, PFOS and PFOA are not regulated contaminants under federal law. They have not been identified as hazardous substances by EPA; they have not been determined to be toxic, ignitable, corrosive, or reactive waste; and there is no Federal enforceable standard limiting their use or level of contamination. Workers exposed to PFCs at manufacturing sites display a higher incidence of bladder, kidney, and testicular cancer.<sup>1</sup> Children exposed to PFCs through drinking water show bioaccumulation in their blood, which has been linked to lower immunological defenses.<sup>2</sup> PFCs have been detected in the breast milk of lactating mothers. In response to these concerns, EPA has published a Preliminary Health Advisory (PHA) of 70 parts per trillion in drinking water. This advisory combines the concentrations of PFOS and PFOA. EPA has listed

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<sup>1</sup> Rich, *New York Times Magazine*, January 10, 2016

<sup>2</sup> *Journal of the American Medical Association*, January 25, 2012, Volume 307, No. 4

both compounds on its latest list of emerging contaminants. EPA requires water systems to test for these chemicals. EPA has not found, under the Safe Drinking Water Act (SDWA), that these chemicals:

1. may have adverse health effects; and
2. occur frequently (or that there is a substantial likelihood that they occur frequently); and
3. there is a meaningful opportunity for health risk reduction for people served by public water systems.

It is of significance that the SDWA requires that all three of these criteria be satisfied before an enforceable standard can be established.

Nonetheless, EPA, pursuant to its authority under the SDWA, has issued orders to the Air Force to abate and prevent “any imminent and substantial endangerment to the health of persons...” whose drinking water source is the aquifer beneath the former Pease Air Force Base, New Hampshire and the Willow Grove Reserve Base in Pennsylvania. These orders require the Air Force to address PFCs in the aquifer and to provide safe drinking water to the users of the aquifer, actions in which the Air Force is presently engaged. Reconciling the failure to establish an enforceable PFOS and PFOA standard, while issuing an enforceable order addressing these same contaminants at specific sites may be possible on legal grounds. But the absence of an enforceable national standard at the federal level does little to assuage citizen concerns about public health associated with drinking water in other communities. The passage of time since this issue has been on the radar further exacerbates public outrage.

A simple solution to this dilemma is for states to establish an enforceable standard. Vermont has already done so and fourteen (14) other states have standards under consideration. A word of caution: state standards should be of uniform application across a state and not target a specific military facility; that uniform standard invites political considerations for those who want to focus on the military source and exclude commercial aviation and industrial sources.

PFOS and PFOA are not CERCLA hazardous substances. As a consequence, transferees of former military bases are not entitled to the benefit of the CERCLA warranty that would obligate the United States to return and clean up pre-existing hazardous substances discovered after transfer of title. Should they later be declared to be CERCLA hazardous substances, the Department of Defense may accord the protections of the CERCLA warranty but the guidance on this matter appears to be discretionary.<sup>3</sup> For those former military bases closed pursuant to a base closure law, the duty of the Secretary of Defense to defend and indemnify owners and those in control for environmental costs, damages, or losses arising from or in any manner predicated upon the release or threatened release of hazardous substances, pollutants or contaminants is found in Section 330 of the FY 1993 National Defense Authorization Act. Although not judicially tested, PFOS and PFOA are pollutants and contaminants.<sup>4</sup>

The SDWA requires the EPA to publish a list of contaminants that are not currently proposed for or are primary drinking water standards, but which are known or anticipated to occur in public drinking water systems. This list is published every five years and is known as the Chemical Contaminants List (CCL). The latest version of the list (the 4th) includes 97 such contaminants, including PFOS and PFOA. EPA is statutorily obligated to consider the health effects and occurrence information in determining the contaminants to be placed on the list. Once on the list, EPA must make a determination of whether or not

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<sup>3</sup> Paragraph 10 c(3)(a)(4), Department of Defense Manual 4715.20, March 9, 2012

<sup>4</sup> 42 U.S.C. 9601(33)

to regulate at least 5 of the listed contaminants within 5 years after completion of the previous round of regulatory determinations.

As an example of the glacial pace of regulatory decision-making, perchlorate, an emerging contaminant, is a component of rocket fuel widely present at military installations and at defense contractor facilities, from which it has migrated into drinking water sources including rivers and aquifers. It was first listed on the CCL in 1998. EPA recently was sued for failing to respond in a timely fashion to establish an enforceable standard for perchlorate. EPA announced in 2011 that it would regulate perchlorate within 24 months. It still has not done so. In response to the lawsuit, EPA has established an aggressive schedule, projecting that it will do so by December 2019.

The very recent release of a draft toxicological study by the Agency for Toxic Substances and Disease Regulatory (ATSDR), an agency within the Federal Centers for Disease Control, does nothing to alleviate the public health concern. It suggests that drinking water is not the only food chain source of exposure and acknowledges significant data gaps in our assessment of causation and impacts on human health. Due to their persistence and bioaccumulation, the fate and transport of PFCs is likely to become a sensitive matter for producers of fruits, vegetables, and animal feed (corn, soybeans, and hay in particular). The introduction of PFCs into the commercial food chain has significant market implications, particularly for those whose market niche focuses on natural product end-users.

Regulatory delay, political hurdles, and the absence of decisive federal action will not satisfy the residents who rely upon potentially affected water sources. Public concern and the expense associated with PFOS and PFOA corrective action suggest that states need to take charge. The public has every right to demand that states establish enforceable drinking water standards of uniform application throughout the state. Attempts to isolate the source to aviation activities (military and commercial), ignoring other industrial and commercial sources, is shortsighted and does not adequately address the public health concern. State standards, to be applicable to federal activities, requires that the standards be uniform and applicable to federal and non-federal activities throughout the state. Standards limited to military facilities will not be enforceable.

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