

Beazley Insight
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Contaminant:
Perfluorinated
Chemicals (PFCs)
and Perfluorooctanoic
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by James J. Wilkins



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*“PFOA pollution is worldwide – and in people’s blood”
(Environmental Working Group, August 20, 2015)*

PFOA, or perfluorooctanoic acid, is not yet a household word. It moved a step closer to widespread notoriety on January 6 this year when the *New York Times Magazine*ⁱ ran a long story on Rob Bilott, an attorney who has devoted much of his working life to suing DuPont for the way it disposed of PFOA at a landfill near Parkersburg, West Virginia, allowing it to enter the local water supply. James Wilkins, environmental underwriter at Beazley, explains why the ubiquity of PFOA and related chemicals may prove a major problem for businesses other than DuPont.

The world economy may be creaking a little at the moment, but it remains the most powerful mechanism in human history for distributing sought-after goods and materials around the planet. But when some of those goods or materials turn out to contain potentially dangerous contaminants, their ubiquity can be a major problem. There are growing fears that this may prove to be the case with perfluorinated chemicals (PFCs) – and with one such chemical in particular, perfluorooctanoic acid (PFOA).ⁱⁱ

The industrial uses of these chemicals are diverse. Their unique lipid- and water-repellent characteristics make them ideal surface-active agents in various high-temperature applications and as a coating on surfaces that contact with strong acids or bases. PFCs have accordingly been used in cleaning products, coatings, leather products, metal plating, paper and packaging, pesticides, photographic products, semiconductors and textiles. Common examples include carpets, chemical resistant tubing, clothing, cookware, electrical wire insulation, food wrappers and packaging, and plumbing seal tape. PFOA was used in the production of Teflon, among other well-known products.

So, what’s the problem? We like our stain-resistant carpet, microwavable popcorn and non-stick cookware. Who has time to scrub pots and pans?

There are two problems. The first is that these chemicals may be very toxic. Opinions vary on how toxic, but the potential risk to human health is quite high. The second problem is that they are very common. PFOA was produced in huge quantities, particularly in the United States, by 3M and DuPont from the late 1940s to the early years of this century.

First, the toxicity. There is broad consensus that the effects of exposure to PFOA can be extensive, ranging from reproductive issues to cancer including, but not limited to, kidney and testicular cancers, birth defects, damage to the immune system, heart and thyroid disease, complications during pregnancy and other serious illnesses and conditions.ⁱⁱⁱ The question is how high a level of exposure to PFOA would be required to generate these effects.

PFOA concentrations in water – What is safe?

A number of entities have sought to set prudent limits for PFOAs in water. They vary hugely, as shown below. The normal metric for such limits is micrograms (i.e. millionths of a gram) per liter – a measure shown as µg/L.

Source	Recommendation	Comparison to EPA Recommendation (PHA)
Environmental Protection Agency's Office of Water (PHA*)	0.4µg/L	N/A
State of New Jersey	0.04µg/L	10 times lower than EPA PHA
Harvard School of Public Health	0.001µg/L	400 times lower than EPA PHA
Environmental Working Group	0.0003 µg/L	Over 1,300 times lower than EPA PHA

*The EPA's Provisional Health Advisory, or PHA, values reflect "reasonable, health-based hazard concentrations above which action should be taken to reduce exposure to unregulated contaminants in drinking water."

DuPont understands all too well the risks and liabilities associated with PFOA. In 2005, it settled a class-action lawsuit brought on behalf of 70,000 mid-Ohio Valley residents for decades of fouling their drinking water.^{iv} In addition, DuPont

and its successor Chemours have approximately 3,500 cases pending in another class-action lawsuit due to releases of PFOA into groundwater as a result of operations at its plant in Parkersburg, West Virginia.^v

Unsurprisingly manufacturers have been pulling the plug on the production of these chemicals. 3M announced a phase-out of PFOA production in 2000/2002 and DuPont promised the same in 2005. DuPont spun off its fluorochemicals business and associated liabilities to a new company (Chemours) in July 2015. At least eight other companies have committed to phasing out PFOA by the end of 2015.

Even if all production of these chemicals were to cease immediately, they would already be very widely distributed. According to the Environmental Working Group, a nonprofit research and advocacy group, “Through Teflon’s use in hundreds of household products, PFOA and closely related chemicals have spread to the remote corners of the Earth, contaminating the blood of virtually all Americans and even passing through the umbilical cord to unborn babies in the womb.”

PFCs and PFOA are persistent in the environment, resistant to natural degradation processes and, as a result, broadly distributed across different trophic (feeding) levels and are present in air, soil, surface water, sediments and groundwater.^{vi} The toxicity, mobility and bioaccumulation potential of PFOA poses potential adverse effects for the environment and human health. PFCs and PFOA are also subject to long-range transport mechanisms, such as marine and fresh waters, and the atmosphere, and have been found as far away as the Arctic region, affecting environmental media and biota (e.g., polar bears). Additionally, PFOA can be formed as a by-product of microbial degradation or by metabolism in larger organisms from a large group of related substances or precursor chemicals.

Sources, causes and distribution mechanisms of PFOA in the environment are myriad and include raw product manufacturers, intermediate products manufacturing, industrial and commercial end-users, water and wastewater treatment facilities and waste disposal facilities.^{vii} In fact, as of 2013, the Superfund Information Systems Database indicates PFCs have been reported in the five-year reviews of 14 hazardous waste sites on the EPA National Priorities List (NPL).

Routes of exposure to PFOA include direct contact, ingestion of food and water, use of commercial products and inhalation. The ingestion of water, fish and fishery products appear to be primary exposure routes to the human population. PFOA is readily absorbed by the body after ingestion and accumulation occurs primarily in the blood, kidneys and liver.

Insurance implications

The implications and responsibilities are broad for those of us that manage and insure against pollution and contaminants with such far-reaching and potentially detrimental effects and consequences.^{viii}

Under an EPA program that periodically requires all U.S. public water systems serving 10,000 or more people to test for contaminants that are not yet regulated, nationwide sampling began in 2013 for PFOA and five other PFCs. As a result, the EPA-mandated tests found PFOA in 27 states and in 94 water systems serving 6.5 million Americans. The results show that outside of the mid-Ohio Valley, New Jersey and California have the most widespread PFOA contamination.

One can only imagine the magnitude of potential damages associated with bodily injury and property damage arising out of PFOA. But it's also important to point out the high costs associated with investigation, sampling and remediation. Adequate detection methods and treatment are expensive, where in-situ remediation appears to be only marginally successful. Rather, ex-situ treatments including activated carbon filters, nano-filtration and reverse osmosis units have been shown to remove PFCs/PFOA from water; however, incineration of the concentrated waste is needed for the complete destruction of PFCs. Research into cost-effective treatment methodologies for PFCs and PFOA is on-going.

In summary, whether it be an upstream primary chemical manufacturer; intermediate product manufacturer; treatment, storage or disposal facility (TSDF); product end-user; water/wastewater treatment plant owner, operator or municipality; or the general public, PFCs in general and PFOA in particular represent significant risk that requires the attention of all that are involved in the fields of risk management and insurance. No single insurance policy applies. A fabric of interwoven coverage extending to products, operations and site-specific issues is needed. Environmental insurance will always be in demand and will continue to evolve. It's why we're here.



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Jim joined Beazley's Environmental Team in May of 2010 and has 20+ years of consulting and environmental insurance experience. Jim is a professional geologist and underwrites fixed-site pollution liability and stop-loss insurance, and GL, professional and CPL insurance for environmental service firms and contractors. Additional products written include excess and umbrella.

- ⁱ The New York Times Magazine (January 6, 2016). The Lawyer Who Became DuPont's Worst Nightmare. <http://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html?mwrsm=Email>
- ⁱⁱ American Cancer Society (November 6, 2013). Teflon and Perfluorooctanoic Acid (PFOA) – What are these substances? Where are they found? Retrieved from <http://www.cancer.org/>
- ⁱⁱⁱ Walker, B. (August 21, 2015). More Bad News for DuPont: Teflon Chemical Builds Up in Breast-fed Babies. Retrieved from <http://www.ewg.org/>
- ^{iv} Walker, B. (September 15, 2015). Day of Reckoning for DuPont Over Teflon Chemical. Retrieved from <http://www.ewg.org/>
- ^v Reisch, M. S. (September 21, 2015). First PFOA Lawsuit Against DuPont, Chemours Goes To Trial. Retrieved from <http://cen.acs.org/index.html>
- ^{vi} Cooke, M. (March 2014). Emerging Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). Retrieved from <http://www3.epa.gov/>
- ^{vii} Environmental Protection Agency (October 14, 2015). Assessing and Managing Chemicals under TSCA – 2010/2015 PFOA Stewardship Program. Retrieved from <http://www3.epa.gov/>
- ^{viii} Walker, B. and Andrews, D. (August 20, 2015). Teflon Chemical Harmful at Smallest Doses EPA's "Safe" Level is Hundreds or Thousands of Times Too Weak. Retrieved from <http://www.ewg.org/>
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