



# nerej

## **Per- and poly-fluoroalkyl substances awareness for the real estate industry - by Frank Ricciardi**

October 05, 2018 - Owners Developers & Managers

Frank Ricciardi,  
Weston & Sampson Engineers

In 2016 and 2017 the emerging contaminants, per- and poly-fluoroalkyl substances (PFASs) made headlines across the country, especially for recent high-profile cases in New York, New Hampshire and Vermont. The two most common PFAS are perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). PFOS and PFOA are comprised of a chain of eight carbon atoms. Seven of the carbon atoms are fully fluorinated and the last carbon atom in the chain has oxygen and other atoms (such as sulfur) attached to it. The discovery of PFAS in public drinking water supplies across the country prompted the Environmental Protection Agency (EPA) and a number of states to set health advisories because these compounds have been utilized in many industrial and commercial products including non-stick cookware, non-stain fabrics, water repellant coatings, fast-food packaging, pesticides and fire-fighting foams. According to EPA: "Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemicals have caused tumors in animals. The most consistent findings are increased cholesterol levels among exposed populations, with more limited findings related to low infant birth weights, effects on the immune system, cancer and thyroid hormone disruption."

On May 19, 2016, the EPA provided a Lifetime Health Advisory standard for PFOS and PFOA. Combined or individually this standard is 70 nanograms per liter [parts per trillion (ppt)]. New Hampshire and Rhode Island have adopted this advisory. In many states, the advisories and standards are even more stringent. In Connecticut and Massachusetts, 5 PFAS are added together for the 70 ppt level. In Vermont, the standard is lower, 20 ppt combined for the 5 PFAS, based on potential toxicity to infants. With the toxicological science evolving and states adopting different standards it is important for environmental managers, contractors and consultants to understand what rules apply and where.

Characterizing the extent and degree of PFAS contamination in various environmental media is challenging due to their chemical characteristics and the need for extremely low laboratory detection

limits (part per trillion, (ppt)). High solubility, low adsorption coefficients, and resistance to degradation make removal of these compounds from contaminated water supplies very difficult. Differing manufacturing processes also result in dozens of PFAS being found in drinking water source samples. For property owners with private drinking water wells, exposure to PFAS may occur if sources exist nearby. In Vermont, water supply wells for individual homeowners were impacted above the 20 ppt standard over 3 miles from the manufacturing source. In addition, atmospheric deposition of PFAS from factory exhaust stacks and agricultural application of wastewater sludge may also be contaminant transport mechanisms.

Important considerations for the real estate industry include identification of sites where emergency response to fires have occurred as well as sites where these compounds may have been used in products. These sites may result in increased liability for property owners, especially if located near water supplies or water bodies. While not a scope consideration for an ASTM Phase I Environmental Site Assessment, property purchasers/owners should ask the question of their environmental consultants during this phase to evaluate potential for PFAS impacts in their perspective real estate transactions.

Remediation of PFAS sites including impacted soil and groundwater can be complicated due to the following issues: very low cleanup standards, limited disposal options for soil, few treatment methods for soil/groundwater, potential fast breakthrough of shorter chain PFAS compounds in carbon treatment, and labor-intensive operation and monitoring.

Real estate professionals should be aware of PFAS sources/sites as these contaminants are very persistent in the environment, dissolve readily in water and can be toxic to humans at very low levels. Working with an experienced environmental consultant can help identify PFAS sites and understand options for protection of site workers/building occupants, point of use treatment, and cost estimation related to PFAS impacts.

Frank Ricciardi, PE, LSP, vice president, EGE program manager, at Weston & Sampson Engineers, Inc., Peabody, Mass.

New England Real Estate Journal - 17 Accord Park Drive #207, Norwell MA 02061 - (781) 878-4540