CHESAPEAKE LEGAL ALLIANCE

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Are forever chemicals, forever?

The dangers of PFAS

Per- and polyfluoroalkyl substances, or PFAS, are a class of synthetic chemicals that are commonly part of the manufacturing process, and are often known by the moniker "forever chemicals." These persistent compounds get their eerie title from their nature as non-biodegradable, non-volatile chemicals that sorb to solids. Worse yet, studies have shown that different varieties of PFAS, such as PFOS and PFOA, are likely to be carcinogenic to humans when consumed orally. More specifically, evidence from epidemiological studies indicates that PFOS consumption is tied to bladder, prostate, liver, kidney, and breast cancers.

Though phased out of the manufacturing process in the United States in 2015, PFAS remains an omnipresent pollutant that can be found in the U.S. food supply, drinking water, and much more. Specifically, PFAS can be found in biosolids—sewage sludge from wastewater treatment plants that is treated and land-applied to farmland as fertilizer. EPA and various state monitoring programs have found that land application of sewage sludge contaminated with PFOA and PFOS caused contamination of soil, surface water, groundwater, crops, beef, eggs, and milk. What makes biosolid contamination so dangerous is that it has also long been known that PFAS and PFOA can accumulate in plants and animal products consumed by humans.

Multiple exposure pathways, including consumption, have allowed PFAS to enter the human body. "PFOA and PFOS have consistently been detected in up to 98% of [blood] serum samples collected in biomonitoring studies" of individuals in the United States. When a majority of a consumer's dietary intake of a product comes from a property impacted by land application of contaminated biosolids, one of the highest risk exposure pathways is consumption of milk from pasture raised cows consuming contaminated forage/soil/water. Cancer risk levels associated with drinking 32 oz of milk per day from cows grazing on contaminated land exceeds 1 in 1,000.

The current regulatory landscape

In January 2025, the federal Environmental Protection Agency (EPA) weighed in on the discussion. The EPA released a Draft Risk Assessment studying the effects of PFAS in biosolids used in land application. This Draft Risk Assessment suggests that land application of sewage sludge with *detectable levels* of PFOA or PFOS can cause human health risks exceeding the

EPA's acceptable threshold as it relates to cancer and non-cancer health effects. Detectable levels equal 1 part per billion (ppb). This is particularly concerning when considering that Maine's comprehensive state sampling of PFOS and PFOA in biosolids found a mean PFOS concentration of 19.3 ppb and a mean PFOA concentration of 6.6 ppb in 2022.

No federal rule has been proposed regulating land application of PFAS contaminated biosolids as of yet. That being said, this Draft Risk Assessment is a step in the right direction based on the best available science. We know that wastewater treatment plants (WWTPs) are capable of reducing PFAS contamination through various sewage treatment methods—a recent study analyzed samples before and after treatment at eight WWTPs in Florida finding that PFOA concentrations before treatment ranged from 1.7-21 ppb, and after treatment ranged from 1.1-7.7 ppb. PFOS concentrations pre-treatment were 4-41 ppb, and 1.4-19 ppb after treatment. Last year, North Carolina proposed a regulatory framework to require WWTPs to begin using advanced filtration technologies that can remove just about all PFAS from their liquid effluent.

Of course, no matter what method of filtration is used to reduce or eliminate PFAS in wastewater, the PFAS are still concentrated into the sludge solids that must be removed from the facility by truck. And that is where more prudent biosolid protections come in. If we do not close the loop on this massive waste disposal challenge, we will simply move PFAS contamination from one place to another.

With the Draft Risk Assessment providing necessary evidence of harm on a national scale, states are capable of acting now more than ever. Although some states have acted in the absence of federal action, the regulations on PFAS contamination in biosolids tend to be conservative. For example, in Maryland, the Department of the Environment's guidance on land application of PFAS contaminated biosolids only recommends that biosolids not be land applied when monitoring results show more than 100 ppb - 100 times the standard described by EPA in its Draft Risk Assessment. The Draft Risk Assessment tells us that the contaminant to risk ratio is 1:1, and therefore PFAS levels of 100 ppb increase cancer and non-cancer human health risks 100 times.

Many exposure pathways for PFAS, or "forever chemicals," are very difficult to identify, let alone regulate. With a relatively comprehensive research landscape, contamination of land applied biosolids is a perfect place to start.