

## Report to the Boards of Health

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### PFAS

PFAS (perfluoroalkyl and polyfluoroalkyl substances), once referred to as PFCs, are a group of man-made chemicals manufactured and used worldwide since the 1950s. These chemicals have been used in numerous products such as:

- Food packaging materials (popcorn bags, fast food containers, pizza boxes)
- Nonstick cookware
- Stain resistant carpet
- Water resistant clothing
- Cleaning products
- Paints, varnishes, and sealants
- Firefighting foam
- Some cosmetics

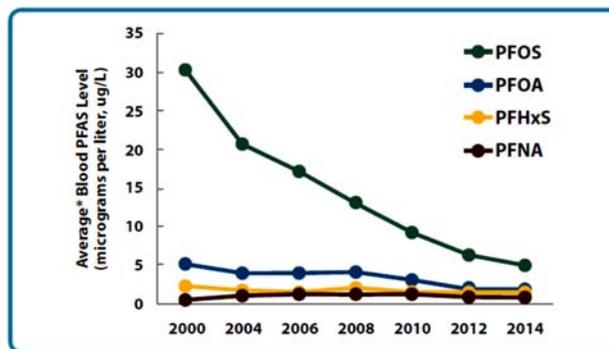
Because so much has been used over so many years, most people in the United States have small but measurable amounts of PFAS in their blood. Fortunately, as global initiatives phased out production of most PFAS agents, blood levels in the general population have been decreasing. These chemicals do not break down easily and PFAS is still found throughout our environment. It takes two to nine years for PFAS in the body to decrease by half.

Studies in humans and animals have not provided consistent or conclusive results regarding the health effects of PFAS. Of the PFAS chemicals, the effects of PFOA, PFOS, and PFHxS on human health have been most studied. Many studies have evaluated large groups of individuals over many years affected by high degrees of work-related or environmental contamination from industrial plants producing PFAS chemicals. One of the best known studies was the C8 Health Project which included 69,030 adults in two states near Parkersburg, West Virginia. This area experienced releases of PFOA (also called C8) from the 1950s until 2002 which contaminated the air, parts of the Ohio River, and ground water.

The potential health effects of PFAS exposure are summarized in [Table One](#) (next page.)

In 2016, the Environmental Protection Agency (EPA) released a health advisory for PFOA and PFOS. A health advisory is a non-enforceable, non-regulatory statement that provides information on a contaminant suspected to cause harmful human health effects and also provides technical information to state agencies and public health officials. The lifetime drinking water health advisory for the combined levels of PFOA and PFOS is 70 parts per trillion (ppt). A lifetime drinking water health advisory, according to the *2012 Edition of the Drinking Water Standards and Health Advisories*, is “the concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects for a lifetime of exposure.” Chemicals proven to cause cancer are not handled under the health advisory system. This level of 70 ppt was developed based on the developmental effects to a fetus or breastfed infant, and are therefore felt to be protective over a lifetime of exposure to individuals of any age or stage of development consuming up to two liters of water per day.

**Blood Levels of the Most Common PFAS in People in the United States from 2000-2014**



\* Average = geometric mean

**Data Source:** Centers for Disease Control and Prevention. Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, (January 2017). Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

**Table One: OVERVIEW OF C8 AND OTHER HUMAN STUDIES**

<b>Cholesterol</b>	Some studies demonstrated associations between serum PFOA and PFOS levels and total cholesterol in: <ul style="list-style-type: none"> <li>- workers exposed to PFAS, and</li> <li>- residents of communities with high levels of PFOA in the drinking water</li> </ul> Other studies have found no association between PFAS exposures and the total cholesterol levels.
<b>Uric acid</b>	Several studies have evaluated the possible association between serum PFOA and serum PFOS levels and uric acid. Significant associations were found between serum PFOA and uric acid levels at all evaluated exposure levels. Elevated uric acid can be associated with high blood pressure and gout.
<b>Liver effects</b>	A number of human studies have used liver enzymes as markers of possible liver effects. In studies of factory workers, no associations between liver enzymes and serum PFOA or PFOS levels were consistently found. A study of highly exposed residents demonstrated significant associations but the increase in liver enzymes was small and not considered to be significant with liver functioning.
<b>Cancer</b>	The International Agency for Research on Cancer (IARC) has classified PFOA as <i>possibly</i> carcinogenic (cancer causing) and EPA has concluded that both PFOA and PFOS are <i>possibly</i> carcinogenic to humans. Some studies have found increases in prostate, kidney, and testicular cancers in workers exposed to PFAS and people living near a PFOA facility. Findings from other studies have not and most did not control for other potential cancer-causing factors, including heavy smoking. Additional research is needed to clarify if there is an association.
Notes: <ul style="list-style-type: none"> <li>• From: <i>An Overview of Perfluoroalkyl and Polyfluoroalkyl Substances and Interim Guidance for Clinicians Responding to Patient Exposure Concerns</i> (CDC ATSDR)</li> <li>• Additional studies have identified possible associations between ulcerative colitis, thyroid disease and pregnancy induced hypertension and higher exposure to PFAS.</li> </ul>	

PFAS chemicals are currently on the list of unregulated water contaminants monitored by the EPA. Unregulated contaminants are chemicals or pollutants suspected to be present in drinking water and have evidence of adverse health effects. The occurrence of these contaminants in drinking water and assessment of the population being exposed are evaluated, allowing the EPA to make decisions about further regulation of these contaminants. In January 2018, Michigan Department of Environmental Quality (MDEQ) set a drinking water criterion of 70 ppt for PFOA and PFOS combined, which sets an official state standard for acceptable concentrations of these contaminants in ground water used for drinking water purposes.

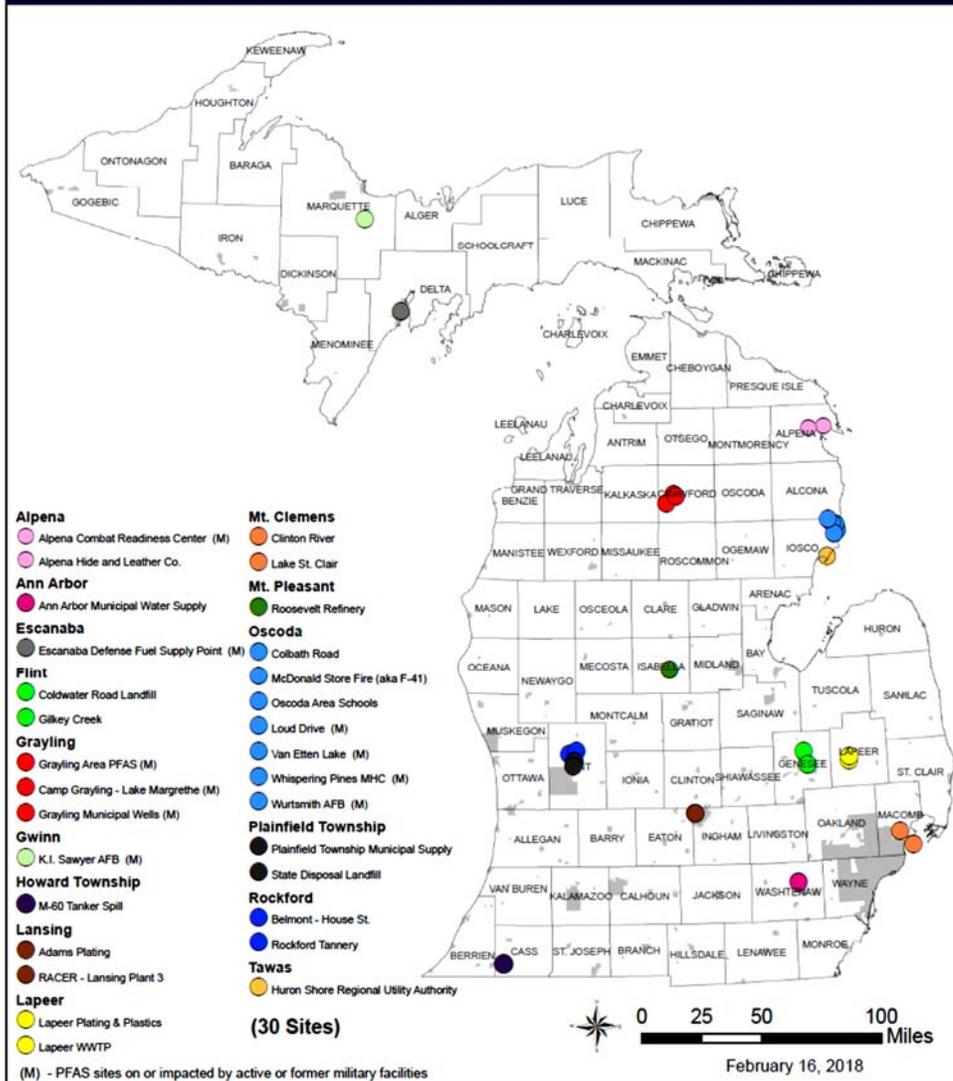
Fortunately, if PFAS is identified in drinking water, it can be removed with the proper water filter. NSF International, (previously the National Sanitation Foundation,) certifies filters capable of PFOA and PFOS reduction after extensive testing. Currently, there are several point-of-use granular activated carbon and reverse osmosis filters that are available. A listing of certified water filters can be found at:

<http://www.nsf.org/consumer-resources/water-quality/drinking-water/perfluorooctanoic-acid-and-perfluorooctanesulfonic-acid-in-drinking-water> .

There are currently numerous sites in Michigan undergoing drinking water evaluations for PFAS that vary in severity and cause (see graphic on next page.) Recognizing this environmental contamination issue requires the teamwork of numerous agencies, the governor established the Michigan PFAS Action Response Team (MPART) in November 2017. Many other states have also been dealing with this emerging contaminant. The EPA invited all states and territories to a National Leadership Summit in Washington, D.C., on May 22 and 23, in order to discuss PFAS and share information.

**Healthy Living Recommendations**

1. Recognize PFAS as a group of numerous chemicals in use for decades for many purposes, and its potential harmful health effects.
2. Support continued efforts at the state and national level to coordinate efforts to effectively respond to PFAS contaminated sites, and ongoing evaluation of the effects of PFAS in the environment and drinking water.



## Sources

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