

Frequently Asked Questions on Air Quality Related Issues

Air Quality Workgroup – Michigan PFAS Action Response Team (MPART)

August 2019

GENERAL PFAS QUESTIONS

1. What are PFAS?

Per – and polyfluoroalkyl substances (PFAS) are a group of manufactured chemicals not found naturally in the environment. The unique physical and chemical properties make them resistant to water, oil and heat. For decades PFAS have been used in various industrial applications such as fire-fighting foams and metal plating, as well as consumer products including on carpeting, waterproof clothing and upholstery. Much of what is known about PFAS is based on studies on perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).

2. Why should I be concerned about PFAS?

PFAS do not break down easily in the environment which means these chemicals last for a long time once released. With repeated exposure some PFAS compounds may build up in the blood and organs, and they have been shown to be associated with some adverse health effects.

3. What is being done on a state-wide basis?

Michigan has assembled a Michigan PFAS Action Response Team (MPART) from seven state departments (Michigan.gov/PFASResponse) that is tasked with protecting public health and the environment from PFAS. Municipal, school and daycare drinking water systems have been tested. Freshwater, groundwater, residential well, biosolid, fish and deer samples are being collected and analyzed, and direct and indirect discharges to surface water are being investigated. This unique, multi-agency approach ensures coordination and cooperation among the agencies and includes 16 workgroups addressing specific issues including a comprehensive review of PFAS toxicity.

4. Can PFAS be found in outdoor air?

Yes, PFAS have reportedly been detected in outdoor air in other states. These detections have been geographically associated with PFAS chemical production sites or large industrial manufacturing process utilizing PFAS-containing materials.

5. Can PFAS be found in indoor air?

Yes, some PFAS chemicals have been measured in indoor air and household dust. Certain PFAS chemicals like fluorotelomer alcohols (FTOHs) are often found in indoor air while PFOS and PFOA have been detected in household dust. Levels in the home will depend on the types of consumer products in the home. However, there is limited information about health risks associated with inhalation of the various PFAS that have been found in indoor air.

6. Are levels higher in outdoor or indoor air?

Because of the concentrated presence of consumer products containing PFAS and lower air circulation rates, typical levels of PFAS are expected to be higher indoors, compared to outdoor air.

7. **Do PFAS have an odor?**

No.

GENERAL HEALTH IMPLICATIONS

8. **Is there a difference to my health between inhaling of PFAS or ingesting PFAS-containing dust?**

If present in air, PFAS is likely absorbed into the body by the inhalation route of exposure; however, this route of exposure likely contributes far less PFAS to your body than eating and drinking contaminated food and water.

9. **Does inhaling PFAS while showering pose a health risk?**

Showering with water containing the common PFAS chemicals, PFOS and PFOA, is not likely a health risk because exposure during a shower is not long enough to inhale significant amounts of PFAS. Also, PFOS and PFOA would not be present in the steam at shower water temperatures due to their higher than water boiling points. However, it is advisable to follow any public health recommendation in place for your water.

10. **Is the outdoor air safe to breath if a known source of PFAS is identified?**

The Air Quality Division (AQD) has derived health-based standards for PFOS and PFOA in outdoor air. Air concentrations below these standards are anticipated to pose no or minimal risk to the public health, including sensitive individuals such as the elderly and children. These standards are applied to new and modified sources of air contaminants.

Most levels reported in outdoor air within the published literature are below these standards. The only concentrations that exceeded the health-based standards were found in other states around large manufacturing facilities for PFAS that operate outside of Michigan. Also, the official PFAS Sites in Michigan identified by MPART are based on concentrations of PFAS in groundwater; drinking water is generally a much more significant source of exposure to PFAS than air.

11. **Which PFAS are most volatile (e.g., most likely to evaporate)?**

Most PFAS evaporate into the air at very low rates. However, it is known that certain types of PFAS are more volatile than others. Based on differences in volatility and the variety of industrial uses of PFAS chemicals, additional information is needed to more fully understand the transport and transformation of PFAS and the associated human exposure routes.

SOURCES OF PFAS

12. **Can PFAS be released into the air from an industrial smoke stack?**

Yes. Stack test data from other states like North Carolina (NC), New Hampshire (NH), and New York (NY) have confirmed PFAS emissions from smoke stacks using a modified version of an existing test method. These sources include PFAS manufacturing facilities and large industrial users of PFAS-containing products. Similar source types have not been identified in Michigan, to date. Stack testing has not been

conducted for any sources in Michigan, to date. No USEPA-approved stack test method for measuring PFAS in air is currently available but is anticipated by the end of 2019.

13. What is the temperature at which PFAS can be destroyed in an incinerator?

Most references in the published literature report PFAS destruction at temperatures greater than 1,200°F. However, some sources call for temperatures greater than 2,000°F, along with the consideration of other important combustion parameters needed for complete destruction.

14. What air pollution control devices are best for PFAS?

No facilities in Michigan currently have air pollution control devices that were installed specifically to address PFAS emissions. Other states have installed controls for PFAS emissions including thermal oxidizers, carbon absorption and wet scrubbers with packed bed fiber filters, to name a few. The appropriate control strategy will likely vary based on the specific PFAS chemicals involved. More research is necessary to determine if the PFAS is permanently captured and not simply transferred to other media, such as wastewater or sludge.

For additional information, visit these sites:

- [North Carolina Department of Environmental Quality - GenX Investigation](#)
- [New York Department of Environmental Conservation - PFAS](#)
- [New Hampshire Department of Environmental Services - PFAS Investigation](#)
- [Vermont Department of Environmental Conservation - PFAS Investigation](#)

15. What are known sources of PFAS to the air?

Known (and suspected) air sources have been identified at Teflon manufacturing facilities, PFAS-containing coating facilities, chrome platers, landfills, and wastewater treatment plants.

16. How do air sources of PFAS contaminate water?

PFAS can attach to particles or dissolve in rain and snow, which are then deposited to land and water from the air. This is a process known as atmospheric deposition.

TESTING/MONITORING

17. What are the recommended methods for monitoring PFAS in air and rain?

There is currently no U.S. Environmental Protection Agency (USEPA) approved method for ambient air monitoring of PFAS, although method development is underway. North Carolina, working in cooperation with the USEPA, has conducted sampling for rain water. [North Carolina Department of Environmental Quality - GenX Investigation](#).

18. What stack (“smoke stack”) test method is recommended for PFAS?

There is currently no USEPA approved stack test methodology. However, some states have conducted stack testing using a modified USEPA Method 5. These states include: NY, NH, and NC. The USEPA expects to have an approved stack test sampling method by the end of 2019.

ENVIRONMENTAL FATE AND TRANSPORT

19. Can PFAS be transported long distances in air?

Yes. The state of North Carolina has demonstrated atmospheric deposition of PFAS many miles downwind from a manufacturing facility. New Hampshire found contaminated groundwater was caused by atmospheric deposition of PFAS from industrial emissions of PFAS. Additionally, PFAS have been sampled and found in remote regions such as the arctic.

20. Can PFAS be transformed in air?

Yes, some PFAS compounds transform in the air. For example, volatile precursors like 8:2 FTOH can transform to PFOA in the air.

REGULATIONS

21. What regulations cover PFAS in air? State and/or Federal?

At the federal level, chrome platers are not allowed to add additional PFOS-containing mist/fume suppressants (above 1%) after 9/21/2015. The AQD's inspections of affected chrome plating sources in 2017 and 2018 showed compliance with this requirement. However, most replacement mist/fume suppressants still contain PFAS chemicals, just not the specific compound called PFOS.

At the state level, new or modified sources that are required to obtain an air use permit would be subject to Michigan's air toxics rules. If PFAS are emitted above certain thresholds they would be required to meet a health-based screening level in the air before a company could be issued an air permit. However, several permitting exemptions exist for PFAS use under the current air toxics regulations.

22. What health-based screening levels exist for air?

The AQD derived health-based screening levels for PFOA and PFOS. Both screening levels are 0.07 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) with a 24-hour averaging time. If both PFOA and PFOS are present in the air emissions, the combined concentration of these substances must be below 0.07 $\mu\text{g}/\text{m}^3$, with a 24-hour averaging time. Screening levels are health protective values, such that if air concentrations do not exceed these levels, adverse health effects are not expected. Screening levels are designed to be protective for sensitive individuals, including children and the elderly. Additional screening levels could be developed as other PFAS are identified in future permit applications.

23. What regulations limit PFAS air emissions?

In Michigan, only air emissions from new or modified sources would be subject to meeting health-based screening levels for PFAS (if they are not otherwise exempt from the air toxics rules).

24. Are any Michigan facilities with an air permit using or releasing PFAS?

Yes, some examples that may release PFAS to the outdoor air include chrome platers, paint/coating facilities, burn-off ovens, and a textile coater. These sources are not PFAS manufacturers, nor do they use PFAS chemicals at the levels noted in other states in which atmospheric deposition has been demonstrated.

STATE AND FEDERAL ACTIONS

25. Are different states finding PFAS in air?

Yes. Minnesota found PFAS in outdoor air several years ago, and NC found PFAS in rain water.

[Minnesota Pollution Control Agency](#)

[North Carolina Department of Environmental Quality - GenX Investigation](#)

26. What is Michigan doing to address PFAS in air?

The AQD inspected all chrome platers in the state to determine PFOS use. None were using PFOS in their process; however, 28 chrome plating facilities still use PFAS substances other than PFOS. Efforts are underway to identify safer alternatives for the chrome plater industry. AQD staff will develop additional health-based screening levels for PFAS compounds, as needed. Staff are learning more about how PFAS is used and estimating potential air releases. The AQD is also collecting information from other states, the USEPA, and the published literature on air-related PFAS issues.

As the uses of PFAS chemicals by industry are identified through air permit applications the AQD will screen allowed emissions for any potential adverse health effects as required in the air toxics rules. Appropriate air permitting measures for PFAS (such as material limits, material substitution, control requirements, emission limits and/or stack dispersion requirements) will be included in future air permits, as necessary. Revisions of Part 2 air rules will be pursued to better address PFAS emissions.

27. What are the USEPA and Agency for Toxic Substances and Disease Registry (ATSDR) doing regarding PFAS in air?

On February 14, 2018, the USEPA announced their PFAS Action Plan and associated Fact Sheet. These can both be found at the [USEPA's PFAS Action Plan](#) site. ATSDR also maintains a web site dedicated to PFAS: [PFAS and your health](#).