

PFAS at Minnesota compost sites

Findings overview from 2019 per- and polyfluoroalkyl study

Per- and polyfluoroalkyl substances (PFAS) are a group of widely used synthetic chemicals found in many products, including non-stick cookware, commercial household products, cosmetics, food packaging, firefighting foam, and waterproof clothing carpeting and furniture. Commercial compost sites accept only organic wastes such as food waste, compostable food packaging and yard waste. PFAS never break down in the environment, and are harmful to human health. As PFAS enter the waste stream, these chemicals create challenges in managing water runoff from compost sites (contact water) and landfills (leachate) and at wastewater treatment plants.

Minnesota currently has nine large-scale compost sites permitted to accept food waste (source-separated organics facilities, or SSOM facilities), and more than 115 sites that collect yard waste only. The state would like to encourage more composting of food scraps, yard waste and other organic material. There are many environmental benefits to composting organics, including reducing greenhouse gas emissions and supporting improved soil health. Yard waste facilities and SSOM facilities are subject to different environmental regulations.

- Composters that accept only yard waste are not required to collect and treat water that comes in contact with yard waste. Instead, these facilities are designed to minimize water run-on and run-off. Yard waste facilities are prohibited from discharging water to waters of the state.
- Composters that accept food scraps and compostable products are required to collect and treat contact water (water that has come in contact with organic material during the early stages of composting). Most SSOM compost facilities manage their contact water by sending it to a wastewater treatment plant.

Contact water study

In 2017, the Minnesota Department of Health set new standards for PFAS levels in drinking water. The standards apply to some types of PFAS and set low allowable concentrations (in the parts per trillion). Given these new health risk thresholds, and the compost industry's desire to have alternative contact water management options, the Minnesota Pollution Control Agency (MPCA) decided to gather more data on PFAS concentrations in contact water.

The MPCA requires composters to test their contact water for PFAS, and other potential pollutants. Test results sometimes showed PFAS concentrations at or above the current solid waste program intervention limits.

To learn more, MPCA commissioned a study to evaluate PFAS concentrations in contact water. The study collected data from five SSOM facilities and two yard waste sites. The study included three sampling events and evaluated up to 29 different PFAS compounds at each site.

Preliminary results

The study confirmed the presence of one or more PFAS chemicals at concentrations above intervention limits at all SSOM and yard waste sites sampled.

- At the SSOM facilities, the detected PFAS included PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFBS, PFHxS and PFOS.

- For the yard waste sites, the detected PFAS included PFBA, PFPeA, PFHxA, PFOA, PFBS, PFHxS, and PFOS.
- At every compost site in our study, at least one sampling event revealed a PFAS analyte that was over the applicable Health Risk Limit (HRL) or Health Based Value (HBV).

The study compared PFAS concentrations with published data on ambient background levels, and found that PFAS concentrations at the SSOM and yard waste sites were generally greater than reported ambient concentrations of PFAS in groundwater across Minnesota. The study also compared PFAS concentrations from Minnesota compost sites to PFAS concentrations in leachate from landfills in Michigan. Generally, PFAS concentrations were lower at Minnesota's compost sites than the reported data for landfill leachate in Michigan.

MPCA recommendations

For compost facilities: All SSOM compost sites should continue to direct contact water to wastewater treatment plants. Land application of untreated contact water is not viable currently unless onsite treatment or feedstock restrictions can lower PFAS concentrations.

For policy makers: To reduce risk of products containing PFAS entering compost facilities, policy makers should consider limits or bans for PFAS in consumer products and industrial uses.

For consumers: Continue composting. As long as PFAS is produced and discarded, we will find these chemicals in all areas where we discard things (landfills, wastewater treatment plants, etc.). Composting itself does not create PFAS, and composting has many environmental benefits.

Overall, more research is needed to understand the sources, amounts, and impacts of PFAS at compost sites and in contact water, as well as potential treatment options. The study also raises additional questions that need answering:

- What are the specific sources of PFAS in compost and yard waste?
- How much variation is there in concentrations of PFAS at SSOM facilities and yard waste sites?
- Are there seasonal variations in PFAS levels in contact water?
- What is the best way to screen for PFAS at compost and yard waste sites?
- Are there alternative strategies for treating contact water to reduce PFAS concentrations? What technologies are currently available?
- How does this data compare to other PFAS and composting research, including the MPCA's groundwater monitoring adjacent to two Carver County compost sites in 2017-2018?
- Is PFAS making its way into final commercial compost products?
- What are PFAS concentrations in surface waters and stormwater ponds and in other settings where there are ambient levels of PFAS?