San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Microplastics and Drinking Water

WHAT ARE MICROPLASTICS?

The State Water Resources Control Board (SWRCB) defines microplastics as being made of chemically derived plastics[1] that have at least three sides greater than 1 nanometer and less than 5,000 micrometers. The SWRCB recently adopted a definition of microplastics in drinking water that can be found here: www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2020/rs2020_0021.pdf. The referenced microplastics definition is subject to change in response to more research and new information.

WHAT ARE THE SOURCES OF MICROPLASTICS IN WATER?

Known sources of microplastics in water include: microfibers from synthetic fabrics, such as, fleece jackets, microbeads in household cleaning products, microfibers from car tires, paint dust, and breakdown of larger plastic debris. Microfibers from synthetic fabrics slough off during machine washing and pass through wastewater treatment plants unchanged, consequently entering water supplies that are located downstream of wastewater discharges. Microbeads in household cleaning products may be washed down drains to wastewater plant discharges, and wear and tear from car tires can be carried by stormwater runoff from streets into a water source. Paint dust, and larger plastic debris (e.g., plastic bags, foam packaging, and other disposable plastic) may break down into micro-sized particles over time when exposed to the sun and water and may be carried in the air to be deposited to water sources or may be introduced directly into water from runoff or improper solid waste disposal.

Municipal wastewater treatment plants are a significant source of microplastics into water bodies in the United States (Pivokonsky et al 2019; Koelmans et al 2019). The removal of microplastics from water depends on the particle size. Over 90% of microplastics are removed during wastewater treatment; however, removal efficiency of smaller particles is lower (Browne et al., 2011).

1. Chemically derived plastics: polyethylene (PE), polyethylene terephthalate (PET), polypropylene (PP), polyvinyl chloride (PVC) and polystyrene (PS).

CAN I HAVE MY WATER TESTED?

Not currently. The SWRCB adopted standard methods to test drinking water for microplastics in September 2022. The SWRCB is also in the process of adopting requirements for utilities to monitor microplastics in drinking water, including public disclosure of the findings.

SFPUC anticipates doing voluntary monitoring of microplastics in 2023 after a sampling method is determined by SWRCB.

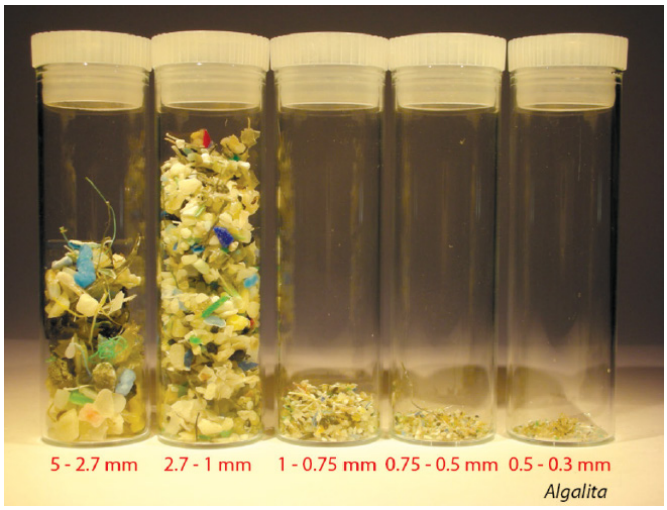
IS OUR DRINKING WATER AT RISK OF CONTAMINATION FROM MICROPLASTICS?

SFPUC's protected watersheds are at a significantly lower risk of contamination by microplastics compared to waters that are impacted by wastewater discharges or urban runoff and for this reason the SFPUC does not expect high levels of microplastics in its source waters or treated drinking waters. Because the methods for monitoring microplastics in drinking water have not been standardized, there are few studies of their presence in drinking water (Koelmans et al 2019). The San Francisco Public Utilities Commission (SFPUC) has not monitored its source waters or treated waters for microplastics. However, the SFPUC will conduct microplastic monitoring when testing and reporting requirements are approved by SWRCB.

Consumer products that may contain plastic source material

HEALTH CONSIDERATIONS

It is unknown whether there are any human health effects from exposure to microplastics in drinking water. There is some evidence that microplastics behave like natural particles and adsorb and transport contaminants, however, more research is needed to determine the effects of ingestion of microplastic particles and whether there are additional effects from contaminants contained within plastics. The health effects from microplastics are likely to be different from those of nanoparticles, which are much smaller particles compared to microplastics. Much work remains to be done to characterize and understand the human health effects of microplastics specific to ingestion in drinking water (Lehner et al 2019, Koelmans et al 2017). The SWRCB convened a Microplastics Health Effects Workshop in 2020 to develop human health thresholds for microplastics exposure. The workshop concluded that further research is needed to develop health-based guidance levels for regulatory purposes.



Size distribution of plastics from Manta trawl (sample from water surface with net). Microplastics measured between 0.5 to 0.3 mm could pass through a modern-day filtration treatment plant (WRF, 2018).

CONSUMER RESOURCES: REGULATION/HEALTH

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We're Committed to Quality: Our highly trained chemists, technicians and inspectors consistently monitor the water we serve—throughout our system, every day of the year. For additional information and materials, please visit **sfpuc.org/waterquality**. For questions about YOUR water, please call 311. You can also visit **sf311.org**.