

February 28, 2020

MassDEP Drinking Water Program
One Winter Street, 5th Floor
Boston, MA 02108
Attn: PFAS MCL Comments

To MassDEP Drinking Water Program:

We are writing to comment on Massachusetts' proposed PFAS Maximum Contaminant Levels (MCLs). We are a group of academic researchers who study the scientific, regulatory, and economic considerations related to per- and polyfluoroalkyl substances (PFAS) in the United States. We convened two national PFAS conferences, which brought together academics, state and federal regulators, and impacted communities, and have published broadly on PFAS-related topics including a comparison of the scientific and political factors shaping different state PFAS water advisory levels (1).

We applaud the State for drafting what are currently some of the strongest existing standards in the nation for PFAS, an ever-expanding and complex group of chemicals. However, we urge MassDEP to consider taking a stronger stance by continuing to recognize the best available, newly developed science; considering the effect of replacement PFAS; and approaching PFAS as a chemical class. With regulatory action from the federal government unlikely to be health protective and timely, combined with the non-enforceable EPA health advisory and ATSDR MRL standards, it is even more important that Massachusetts take action to protect public health.

Newly published studies should be taken into consideration

We encourage MassDEP to consider new studies that have been published since the Technical Support Document was prepared that identify associations between exposure to PFAS and a range of health effects. We outline some of these studies in the following paragraphs.

Toxicological

MassDEP followed the direction of federal agencies and based state drinking water values on non-cancer effects. In the Technical Support Document, MassDEP referenced the National Toxicology Program (NTP) summary data tables that were issued regarding animal bioassay data which reported elevated pancreatic and liver tumor rates following high dose exposure to PFOA, but for which a final report had not been issued. However, there has been an update since that previous review. A Draft NTP Technical Report was issued on December 16, 2019 after a peer review by a panel of experts, which unanimously endorsed findings from the study. The peer review panel agreed with NTP research that there was *clear evidence* of carcinogenic activity following PFOA exposure in male rats and *some evidence* of such activity in female rats, further pointing to the strength of these findings (2). Given peer-reviewed approval of the NTP Technical Report, we urge you to set more stringent MCLs that are protective of the sensitive health endpoints identified by the study.

Epidemiological

Findings from a recent nested case-control study of non-occupationally exposed postmenopausal women in France suggest a linear dose-response relationship between PFOS serum concentrations and the risk of developing hormone receptor-positive breast cancer (3). The cases were pulled from a cohort study involving 98,995 women, and researchers were able to prospectively investigate health effects of PFOS and PFOA. The study points to the importance of PFAS as a potential risk factor for breast cancer.

Published in 2018, but not mentioned in the technical review, is an ecological study from Italy which found statistically significant relative risks for overall mortality, kidney and breast cancer, among other diseases, in PFAS contaminated areas (drinking water exceeding either 30 ng/l for PFOS, 500 ng/l for PFOA, or 500 ng/l for other PFAS) in comparison with uncontaminated areas, pointing to the need to reduce exposure of populations to PFAS in drinking water (4).

The volume of epidemiological evidence on PFAS will increase substantially in the coming years, particularly with the recent start of three large prospective cohort studies:

- ATSDR Pease Study, which examines human health effects of PFAS exposure through contaminated water in New Hampshire.
- ATSDR Multi-site Study, consisting of 7 sites across the US, will provide a better scientific understanding about the relationship between PFAS exposure and health outcomes, and help people understand their risk for health effects.
- US Air Force announced in January 2020 it is conducting the Pease Military Cancer Mortality Study, a retrospective cohort study examining cancer deaths between 1970 and 2018 at the former Air Force base.

Between these three cohort studies, the last of which is expected to take only a year to complete, **we ask the DEP to commit to reviewing the MCL every three years to be protective of human health and the environment.**

Effects of replacement PFAS should be considered

We strongly recommend that MassDEP consider additional PFAS beyond the currently included six compounds. Many PFAS have been phased out of production and replaced by alternative PFAS compounds, which lack comprehensive toxicity data. Studies of alternatives are just beginning to examine outcomes associated with their exposure.

MassDEP concluded that perfluorobutane sulfonate (PFBS), a common substitute for PFOS, should not be included in the ORSG due to its shorter serum half-life and lower toxicity than other compounds. However, PFBS may not be a safer alternative. Studies have linked pregnant women's exposure to PFBS with preeclampsia and overall hypertensive disorders of pregnancy, as PFBS may impair the ability of cells to form a fully functioning placenta (5). Additionally, an in vitro study found that prenatal exposure to PFBS could cause placental cells to function improperly, echoing the epidemiology data and providing underlying mechanisms (6).

Similarly, findings from a recently published birth cohort study suggest that PFOS alternatives may be reproductive toxicants in humans. The study, which examined chlorinated polyfluorinated ether sulfonic acids (Cl-PFESAs), a replacement for PFOS, on developmental risks from maternal exposure, found associations between greater gestational Cl-PFESAs exposure and higher risk for adverse birth outcomes (7).

PFAS should be regulated as a class

We encourage MassDEP to take a class approach to regulating PFAS. Over 4700 individual PFAS have been identified by the OCED, the majority of which are un- or understudied (8). For this reason, chemical-by-chemical regulation is a time prohibitive and ineffective approach to protect public health. As Dr. Linda Birnbaum, NIEHS Director (retired), stated at a Senate Committee on Environment and Public Works, “current human exposures to PFAS involve complex mixtures, not individual chemicals” (9). This has led numerous leading scientists to call for PFAS to be regulated and studied as a class (10).

In conclusion, we again thank MassDEP for taking the important action of pursuing MCLs for PFAS. We urge MassDEP to consider lower levels for PFAS, as well as MCLs for additional PFAS, and review the MCL every three years to be protective of human health and the environment.

Respectfully submitted,

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