State of New Jersey
Department of Environmental Protection
Division of Water Supply and Geoscience
New Jersey Drinking Water Quality Institute
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DRINKING WATER QUALITY INSTITUTE REQUEST FOR PUBLIC INPUT FOR PERFLUOROOCTANE SULFONATE February 5, 2018

Re: Health Effects Subcommittee Report: Health-Based Maximum Contaminant Level Support Document: Perfluorooctane Sulfonate (PFOS)

The Environmental Working Group (EWG) is a nonprofit public health and environmental research and advocacy organization based in Washington, D.C. Our research focuses on potential health risks from chemical contamination of water, food, consumer products, and the environment. For over a decade, EWG has researched the health impacts of PFCs,* and pushed for stronger regulations at the federal and state levels regarding PFCs' use and production. EWG has also called for more stringent legal limits for the contaminant in drinking water. Of particular concern to EWG are the potential effects of PFC exposure on children and PFC exposure during critical windows of early life development.

With this comment letter that we respectfully submit to the New Jersey Drinking Water Quality Institute, EWG strongly supports the overall approach taken by the state for setting the most stringent MCL for PFOS in the United States, and we urge the adoption of a more health-protective water concentration. We advise the DWQI to utilize the epidemiological evidence of reduced immune suppression at current general population exposure levels to eliminate any additional exposure from water. The DWQI should also consider the additive nature of toxicity from PFOS and other PFC compounds found in NJ water supplies to set a comprehensive MCL for the sum concentration of this family of chemical contaminants.

EWG thanks the DWQI for completing a scientific review of PFOS health impacts and proposing an MCL, as well as for its similar efforts with regards to PFOA and PFNA.

*PFCs are also known as PFAS chemicals, for per- and polyfluoroalkyl substances.

The health effects report provides important guidance and research analysis that can be utilized by regulatory agencies across the country and the globe. In the absence of federal leadership, it is encouraging that the state of New Jersey is moving forward to set a drinking water limit for PFOS contamination. The recent nationwide water testing required by the EPA identified PFOS as a ubiquitous contaminant in drinking water in New Jersey and across the country. In 2016 the EPA set a health advisory limit of 70ng/L for the combined concentration of PFOS and PFOA in drinking water, but has provided no indication that a national MCL will be established.

It is critical for children and vulnerable populations that the MCL be protective from the known health impacts of PFOS exposure. In setting the health advisory level of 70ng/L, the EPA did not consider recent studies that would have resulted in lower health advisory levels. Of particular concern was the lack of incorporation of human epidemiologic evidence of PFOS' impact on the immune system and its ability to reduce effectiveness of vaccines in children. Unlike the EPA, the DQWI utilized the immune system as the critical endpoint of concern in proposing a drinking water limit significantly more protective than the EPA health advisory. But the DWQI relied on mouse data instead of human exposure and human health impacts in setting the proposed MCL.

In the past decade, EWG has published may reports on the health impacts of PFC exposure, with a focus on PFOA and PFOS. EWG has detailed the history of use for these chemicals and reviewed the scientific evidence of the health impacts that may be occurring at environmentally relevant concentrations.[1] EWG has also analyzed the drinking water testing results from New Jersey and the nationwide water sampling results collected through the Unregulated Contaminant Monitoring Rule that were compiled into an online interactive map.[2]

(1) The DWQI should use human epidemiologic evidence of health impacts to set the MCL

EWG is supportive of the scientific analysis and the identification of immunotoxicity as the most sensitive endpoint based on the current evidence. EWG argues that the DWQI should utilize the human studies to set a health protective MCL and ensure that exposure to drinking water does not increase risk above a health-protective threshold. Using the human epidemiologic health impacts would have resulted in a health protective value of 1 ng/L or lower.[3] EWG agrees with the DWQI statements that:

> *Among the epidemiologic studies, the studies of immune effects, and most particularly those investigating effects on vaccine response, were generally consistent in showing adverse responses to PFOS.*

and:

> *The observation of decreased resistance to childhood diseases in association with low, general population levels of PFOS exposure, and the consistency of this effect with a directly analogous outcome from animal studies, decreased plaque forming response, emphasizes the practical public health significance of PFOS-mediated immunosuppression.*

Of concern is that the proposed MCL is not entirely health protective and that any additional exposure in drinking water may pose additional risk. According to the DWQI:

> *It cannot be definitively concluded that lifetime exposure at the proposed Target Human Serum level is protective for the most sensitive effects, including in sensitive subpopulations.*

In 2016 the German Environment Agency completed a review of the evidence of harm from PFOS exposure and set a maximum blood plasma concentration of 5 ng PFOA/ml as the value at which adverse health effects are not expected.[4] This health-protective value was based on human epidemiological evidence of harm, as well as animal studies indicating association of PFOA/PFOS exposure effects on fertility and pregnancy, weight of newborns at birth, lipid metabolism, immunity after vaccination and immunological development, hormonal development, thyroid metabolism and the onset of menopause. A health-protective value of 5 ng/ml is at the median value of the NHANES 2013-2014 testing as presented in the DQWI analysis. Any additional exposure through water would increase exposure over this threshold and should be avoided.[5] From the DWQI analysis, the recommended value of 13 ng/L would lead to an additional exposure burden approximately 50% over the level expected to not cause adverse health effects, as summarized by the German Human Biomonitoring Commission.

(2) The DWQI should evaluate and set an MCL based on the combined concentration of PFC chemicals in drinking water

It is very encouraging that the DWQI and the state of New Jersey are moving forward on establishing contamination limits for PFOA, PFOS and PFNA in drinking water. In the DWQI analysis, it was explicitly stated that the same epidemiology studies of health impacts associated with PFOS exposure are also associated with PFOA exposure:

> *Additionally, the health effects associated with PFOS in epidemiology studies are also associated with PFOA. Therefore, the toxicity of PFOS and other PFCs may be additive. Although PFOS and other PFCs, including PFOA, are known to co-occur in some NJ public water supplies, the potential for additive toxicity of*

PFOS and other PFCs was not considered in development of the Health-based MCL.

Setting MCLs for these contaminants individually is an important first step, but the combined exposure to PFCs must be considered in order to protect health. The EPA established a precedent for this approach by setting a health advisory for combined PFOA and PFOS exposure. These chemicals, along with other PFCs, often contaminate the same water sources. While New Jersey has done water testing with lower reporting limits than the EPA through the UCMR program, it is possible – if not likely – that other PFCs, including short chain replacement chemicals, are contaminating drinking water in the state and adding to the combined toxicity.[6]

The State of New Jersey must quickly move forward and pass a regulatory standard for PFOS, PFOA and PFNA. We request the draft health-based MCL for PFOS be updated to provide a health-protective drinking water concentration that incorporates the human epidemiological impact of exposure at the current general exposure levels. Additionally, the DWQI should move forward in setting a combined MCL for PFC exposure that is reflective of the additive toxicity of this family of compounds.

Sincerely,

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References:

[1] EWG, Poisoned Legacy, May 2015. Available at http://www.ewg.org/research/poisoned-legacy/executive-summary and EWG, Teflon Chemical Harmful at Smallest Doses, August 2015. Available at http://www.ewg.org/research/teflon-chemical-harmful-at-smallest-doses
[2] EWG, Mapping a Contamination Crisis, June 2017. Available at https://www.ewg.org/research/mapping-contamination-crisis
and EWG, PFC Contamination, May 2015. Available at http://static.ewg.org/reports/2015/pfoa_drinking_water/interactive_map/index.html
[3] Philippe Grandjean and Richard Clapp, Perfluorinated Alkyl Substances: Emerging Insights Into Health Risks. New Solutions: A Journal of Environmental and Occupational Health Policy, June 17, 2015. Available: new.sagepub.com/content/25/2/147
[4] Bundesgesundheitsbl, HBM I values for Perfluorooctanoic acid (PFOA) und Perfluorooctanesulfonic acid (PFOS) in blood plasma. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz, October 2016. Available at http://link.springer.com/article/10.1007/s00103-016-2437-1
[5] Centers for Disease Control and Prevention, Fourth National Report on Human Exposure to Environmental Chemicals, February 2015. Available at http://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Feb2015.pdf
[6] EWG, The PFOA Drinking Water Contamination Crisis Just Got Much Bigger, November 2017. Available at https://www.ewg.org/enviroblog/2017/11/pfoa-drinking-water-contamination-crisis-just-got-much-bigger and Matthew Hartz, Eurofins Eaton Analytical, PFAS Monitoring in a Post Health Advisory World-What Should We Be Doing? 2017. Available at https://www.documentcloud.org/documents/4165198-EEA-Study-Documents.html#document/p1/a385870