



AFSO21 LLC
Agile Fire Service Organization



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MEMORANDUM FOR: Pennsylvania Department of Environmental Protection (PADEP)

FROM: Kevin Ferrara
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SUBJECT: Proposed Rulemaking: Safe Drinking Water PFAS MCL Rule (#7-569)

America is dealing with a national crisis involving a silent killer, one that is invisible to the naked eye. This invisible killer, as you read the following comments, is quietly lurking within our communities, within our homes, on our clothing and even within our bodies. I am referring to per- and poly-fluoroalkyl substances (PFAS), a group of man-made compounds that for decades, has been silently sickening and killing humans long before the public first heard about it on the evening television news, local newspapers, social media, and addressed by the Pennsylvania Department of Environmental Protection (PADEP).

My name is Kevin Ferrara. I am life-long Pennsylvania resident as well as a retired United States Air Force (USAF) military firefighter who, for my entire military career, at every military installation I served on, was exposed to toxic PFAS compounds while using Aqueous Film Forming Foam (AFFF), the wearing of firefighter turnout gear, or drinking contaminated water from groundwater aquifers, all of which contain high levels of PFAS compounds found through rigorous testing processes. Those responsible for the pollution did not reveal this evidence on their own, it took years of Freedom of Information Act (FOIA) requests and even litigation to uncover the findings. As information was uncovered, I saw a pattern among those who manufactured PFAS; they knew the compounds were hazardous and toxic but deliberately said nothing.

Today, I am a Service-Disabled Veteran Owned Small Business owner and consultant in Fire Protection and Emergency Services (FPES), headquartered in central Pennsylvania supporting clients around the world in person or virtually. In addition, I host the AFSO21's Weekend Wrap-up Podcast where I, and occasional guests, speak about health and safety issues affecting veterans and firefighters around the world to include PFAS exposure and contamination. I also serve my community as a volunteer firefighter and local Emergency Management Coordinator (EMC).

For those unfamiliar, PFAS is a group of thousands of man-made compounds that were or are included in the manufacturing process of many consumer products like non-stick cookware, water-proof or resistant outdoor clothing, stain resistant furniture or carpet, water-proof cosmetics, food packaging, firefighting foam, and firefighter turnout gear just to name a few. Despite some cookware manufacturers stating their products are PFOA free, in October 2021, the Ecology Center published an article reporting, in 2020 they found 70% of non-stick

cooking pans and 20% of non-stick baking pans tested positive for PTFE, more commonly known as Teflon™.¹

It has been stated, as consumers continue to dispose PFAS-laced products with other trash, the landfill leachate - the liquid pollutant resulting from water moving through the waste pile, will contain high levels of PFAS.² This raises significant concerns for such leachate being discharged to surface waters via wastewater treatment facilities (WWTFs), as well as to public water supplies dependent on those surface waters. As leachate is collected and processed along with wastewater at WWTFs before being discharged to surface waters, this does not mean PFAS compounds are removed.

Over the past several years, I have contributed to many PFAS discussions with researchers, esteemed scientists including toxicologists considered experts in their fields of study by their peers, as well as citizens and environmental groups from other states across the country dealing with their own PFAS issues. Consulting those engagements, I believe if the PADEP wishes to establish practical MCLs for PFOA and PFOS, it must consider other PFAS compounds detected in ground and drinking water across the country and therefore, establish a combined total limit for all the toxic PFAS compounds instead of varying limits for each. In addition to considering other PFAS compounds when establishing MCLs, the PADEP must consider vulnerable populations and sensitive health endpoints.

Ecology Center Public Comments to Michigan DEP

The following are public comments made in 2020 by staff from the Ecology Center in Lansing, Michigan regarding proposed administrative rules establishing Michigan PFAS drinking water standards. I felt inclined to include their public comments with mine as I strongly believe they represent facts the PADEP must consider in its decision to establish PFAS MCLs.

Populations most vulnerable to the impacts of PFAS include fetuses and children, pregnant and nursing mothers, the elderly, the ill, and workers. Vulnerable populations experience more sensitive health endpoints to these toxic compounds and are often more highly exposed to the healthy adult population.

Scientific studies have shown that fetuses and children are particularly vulnerable to the negative health effects of PFAS as they have very sensitive health endpoints and are exposed at a high rate. Fetuses are highly exposed to PFAS in utero; even a minuscule amount of exposure at

¹ Ecology Center, “PFAS Coatings Continue to be Found in Cookware”, 6 October 2021, https://www.ecocenter.org/pfas-coatings-continue-be-found-cookware%2%A0?fbclid=IwAR2pIDFbGuetJm_S0gwCkPqA4o4gGYUb5HDIGit9xCcj0s61-kfSaT3osLo

² For example, according to the Department’s PFAS Sampling Map, PFAS have been detected at levels as high as 6,190 ppt and 3,500 ppt (PFOA and PFOS combined) at the Turnkey Landfill in Rochester. See NHDES PFAS Sampling Map, *supra* note 47

critical time of gestation impacts fetal development³. The shift away from long-chain PFAS towards short-chain exacerbates this disruption as short-chain PFAS cross the placenta more easily⁴. After birth, babies and children experience greater exposure via consumption as they eat and drink more per pound than adults. Furthermore, exposure to PFAS has been shown to decrease immune response, which poses a threat to children getting vaccines as it interferes with the way the body's white blood cells recognize vaccines⁵. Reducing the effectiveness of vaccines in children greatly increases their susceptibility to other health problems for years to come.

Studies have also exemplified the significant health risks PFAS exposure (particularly PFOA exposure) poses for nursing mothers and their children. This increased risk is due to the low-dose sensitivity of mammary glands to PFOA, which was not considered in the MCL development process. Linkages have been made between PFOA exposure and changes in mammary gland development, which alters the morphological and functional development of the glands⁶. A nursing mother exposed to PFOA can pass along negative health effects to her children, resulting in delayed mammary gland development, increased risk of breast cancer, and difficulty breastfeeding. In one study, the offspring of rodents exposed to environmentally relevant concentrations of PFOA (comparable to those experienced by humans) had delayed mammary gland development, delayed epithelial cell differentiation, and altered functional development of mammary glands⁷. That same study found gestational exposure to cause delays in mammary gland development across three generations⁸. The passage of these health risks from mother to child compound the risks PFAS already pose directly to babies and children.

Nursing mothers exposed to PFOA also face additional health risks that harm both them and their child. In lab tests, chronic exposure to environmentally relevant levels of PFOA resulted in morphologically abnormal lactation glands; this reduces the number and density of alveoli that produce milk, ultimately reducing the latency periods to peak milk output⁹. Such functional defects show a correlation that may delay a mother's substantial milk output, and result in cessation of breastfeeding before the recommended time, and ultimately delays the child's development and maturation^{10,11}. The recommended timeline for breastfeeding is exclusively breastfeeding for the first six months of life and breastfeeding supplemented by

³ National Library of Medicine, "Maternal Plasma Concentrations of Per- and Polyfluoroalkyl Substances and Breastfeeding Duration in the Norwegian Mother and Child Cohort", <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6173485/>

⁴ *ibid*

⁵ National Library of Medicine, "Estimated Exposures to Perfluorinated Compounds in Infancy Predict Attenuated Vaccine Antibody Concentrations at Age 5-Years", <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6190594/>

⁶ Environmental Health Perspectives, "Gestational and Chronic Low-Dose PFOA Exposures and Mammary Gland Growth and Differentiation in Three Generations of CD-1 Mice", <https://ehp.niehs.nih.gov/doi/10.1289/ehp.1002741>

⁷ *ibid*

⁸ *ibid*

⁹ *ibid*

¹⁰ NRDC, "PFAS in Drinking Water 2019", https://www.nrdc.org/sites/default/files/media-uploads/nrdc_pfas_report.pdf

¹¹ National Library of Medicine, "Maternal serum perfluoroalkyl substances during pregnancy and duration of breastfeeding", <https://pubmed.ncbi.nlm.nih.gov/27179585/>

complementary foods until the child is one year old¹². Cessation of breastfeeding before this timeline can negatively affect the child's developmental and overall health. Breast milk is rich in nutrients and antibodies that enhance brain development¹². Breastfeeding reduces healthcare costs and provides free, naturally renewable complete nutrition for the first six months of a child's life¹². Moreover, babies that are breastfed have decreased risk of SIDS and necrotizing enterocolitis - the two leading causes of infant death in the United States - and increased academic productivity¹². Exposure to PFAS harms not only breastfed babies but also their mothers. Exposure to PFAS may reduce a mother's ability to properly breastfeed, putting both mother and child at risk. Breastfeeding reduces a mother's likelihood of developing breast cancer later in life and the inability to breastfeed caused by PFAS exposure compounds that likelihood¹³. Additionally, delays in mammary gland development also caused by exposure to PFAS can result in increased vulnerability to carcinogens, heightening a mother's chances of getting breast cancer¹⁴. It is clear that exposure to PFAS, even in small amounts, poses significant health risks to fetuses, babies, children, and nursing mothers. These risks need to be taken into account in lowering the MCL standards.

Other vulnerable populations are also particularly susceptible to the negative effects of PFAS exposure, namely the ill and elderly. The threat of exposure to PFAS interacts with other genetic and environmental influences to negatively impact the elderly population. Exposure at any age may exacerbate stress and inflammation, ultimately contributing to the risk of neurological diseases later in life¹⁵. At any point in life, those who are ill are also at additional risk due to PFAS exposure. Similarly of children, the ill may also experience decreased immune response as an effect of PFAS exposure. Because PFAS acts as an endocrine disruptor, it decreases immunity and makes already sick bodies more susceptible to disease¹⁶.

Lastly, workers who have high occupational exposure to PFAS on the job are also a particularly vulnerable population that should be considered. In Michigan, some examples of highly exposed workers include those who have worked on chrome-plating for the auto industry, firefighters, pulp and paper processors, and those who are involved in furniture and apparel production. People with high levels of occupational exposure will have an additive source of exposure through their drinking water. While many companies have shifted focus away from long-chain PFAS they are increasingly focused on short-chain PFAS. The use of short-chain PFAS does not decrease the health risks to humans. Short-chain PFAS do not break down in the environment or our bodies and bioaccumulate in the same fashion as long-chain PFAS. Short-chain PFAS, however, are harder to filter out of drinking water than long-chain¹⁷. The MCLs for

¹² Michigan Breastfeeding Network (MIBFN), <https://mibreastfeeding.org/wp-content/uploads/2019/06/MIBFN-2019-Advocacy-Overview.pdf>

¹³ NRDC, "PFAS in Drinking Water 2019", https://www.nrdc.org/sites/default/files/media-uploads/nrdc_pfas_report.pdf

¹⁴ *ibid*

¹⁵ Greater Boston Physicians for Social Responsibility and Science and Environment Health Network, "Environmental Threats to Health Aging", http://www.agehealthy.org/pdf/GBPSRSEHN_HealthyAging1017.pdf

¹⁶ National Toxicology Program, "NTP Monograph", https://ntp.niehs.nih.gov/ntp/ohat/pfoa_pfos/pfoa_pfosmonograph_508.pdf

¹⁷ Green Science Policy Institute, "Fluorinated Alternatives: Myth versus Facts", <https://greensciencepolicy.org/docs/fluorinated-alternatives-fact-sheet-17-02-22.pdf>

short-chain PFAS have been adopted from manufacturing companies and are based on limited studies and flawed assumptions. These limits do not protect the general population, nor manufacturing workers.

Endocrine disruptor abnormalities, like those caused by exposure to PFAS, happen in real-time. This means that the risk to workers isn't only related to the duration of exposure or bioaccumulation. Workers exposed to PFAS compounds can experience negative health effects after one-time acute exposures. This highly exposed population should be considered in setting the MCLs. To protect everyone - including the aforementioned vulnerable populations - the proposed MCLs must be revised and lowered, given these considerations.

EPA's Lifetime Health Advisory Versus Half-life of PFAS Compounds

In 2016, the U.S. Environmental Protection Agency (EPA) created 70ppt Lifetime Health Advisories (LHAs) for PFOA and PFOS in drinking water. LHAs consider chronic or long-term exposure that is not expected to cause adverse effects after a lifetime of exposure. Something to be aware of is, LHAs are intended to protect a 154-pound adult consuming 2 liters of water daily over 70-years.¹⁸ Obviously, not all Keystone Stater's are 154-pound adults and consume 2 liters of water daily.

The EPA's 70ppt LHAs for PFOS and PFOA are often misinterpreted as the maximum amount of PFOS or PFOA an individual may consume in their entire lifetime. The EPA would have the public believe a 154-pound adult, consuming 2 liters of water containing 70ppt of PFOS or PFOA, daily over 70-years, is not at risk of developing some type of illness or cancer. I, along with thousands of military firefighters who have various medical illnesses or conditions, along with our health care providers who believe our illnesses are associated to PFOS and PFOA, fervently disagree, and challenge the EPA to reconsider and the PADEP to consider when proposing MCLs.

Pennsylvania's population is approximately 12,964,056.¹⁹ The life expectancy at birth for Pennsylvanians in total is 78.3.²⁰ Applying the EPA's theory regarding exposure to PFOS or PFOA, a Pennsylvanian could consume from birth, 70ppt of PFOS or PFOA in drinking water daily for 78.3 years and not expect any adverse health effects. I have a tough time accepting that theory based on the previous public comment made by the Ecology Center to Michigan leaders, "...fetuses and children are particularly vulnerable to the negative health effects of PFAS as they have very sensitive health endpoints and are exposed at a high rate. Fetuses are highly exposed

¹⁸ Iowa Department of Natural Resources, "Drinking Water Health Advisories", <https://www.iowadnr.gov/Environmental-Protection/Water-Quality/Drinking-Water-Compliance/Drinking-Water-Health-Advisories>

¹⁹ United States Census Bureau, Quick Facts, PA, <https://www.census.gov/quickfacts/PA>.

²⁰ CDC / National Vital Statistics System, "U.S. State Life Tables, 2019", (February 2022): 3

to PFAS in utero; even a minuscule amount of exposure at critical time of gestation impacts fetal development”²¹.

PADEP is proposing to establish MCLs in drinking water of 14ppt for PFOA and 18ppt for PFOS. While significantly less than the EPA’s LHAs these lower levels will not adequately protect the public from becoming sick due to repeated exposure or consumption of the toxic, man-made compounds. If anything, lower MCLs provide the public a false sense of security in believing the water is much safer to drink because the permissible volume of impurities is lowered. Some might say, even though man-made PFOA and PFOS compounds are known to be toxic, lower levels may not harm you as quickly as higher levels might. The reality is, as the Ecology Center previously stated, an acute, single, small dosage of PFOA or PFOS compound can cause the human body to develop some type of disease or illness like cancer.

I understand the PADEP proposed MCLs pertain to PFOS and PFOA compound levels in drinking water, but absent of another pertinent metric, for the purpose of the following, I am using the proposed MCLs as a benchmark for comparison to levels found in human blood serum.

The Agency for Toxic Substances and Disease Registry (ATSDR), in May 2021, published a table identifying the half-life of six PFAS compounds²², five of which are currently being tested for by the U.S. Department of Defense (DoD) during annual PFAS blood testing of DoD firefighters. The half-life of PFOA in humans is 2.1 - 10.1 years, and the half-life of PFOS in humans is 3.3 - 27 years. Of course, those half-life rates are dependent on the human never being exposed to PFOA or PFOS compounds again. Should the human be exposed to PFOA or PFOS compounds again within the half-life timeframe by consuming water containing such compounds, the clock would reset and depending on how the compounds accumulate and decay, our bodies do not react the same, the new half-life could be greater than their life expectancy, especially for those within our vulnerable populations, i.e., our elderly and ill citizens.

The only way of truly knowing the amount of PFAS compounds in our bodies is by having our blood tested. As mentioned previously, DoD firefighters are tested for PFAS compounds during their annual Occupational Health Exam. The blood test involves analyzing the following PFAS compounds: PFBS, PFHpA, PFHxS, PFOA, PFNA, and PFOS. Because I am no longer serving on Active Duty, I am ineligible for the DoD PFAS blood test however, earlier this year, I was fortunate to have my blood tested by a laboratory that offers a comprehensive PFAS blood test kit to the public²³.

²¹ National Library of Medicine, “Maternal Plasma Concentrations of Per- and Polyfluoroalkyl Substances and Breastfeeding Duration in the Norwegian Mother and Child Cohort”, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6173485/>

²² Agency for Toxic Substances and Diseases Registry, *Toxicological Profile for Perfluoroalkyls*, Table 1-1, pg. 5, May 2021.

²³ EmpowerDX, *PFAS Exposure™ Blood Test (40+ compounds)*, <https://empowerdxc.com/products/product/pfas-exposure-test>

Understanding that PFAS compounds in water concentrations and human concentrations are not comparable, my recent PFAS blood test results indicated I have approximately 22.8 ng/mL of PFOS in my blood serum which equates to approximately 22,800ppt. The laboratory that tested my blood indicated a Reporting Limit (RL) for PFOA and PFOS at 0.20 ng/mL which equates to 200ppt. The laboratories analyzing blood for DoD firefighters indicate a RL for PFOA and PFOS at 0.50 ng/mL or 500ppt.

Assuming I am never exposed to PFOS compounds again, according to the ATSDR Table 1-1, Summary of Estimated Elimination Half-lives for Select Perfluoroalkyls²⁴, it could take as little as 20 years or upwards of 162 years before my current PFOS levels decay to the 0.20 ng/mL, 200ppt RL. Using the PADEP proposed MCL as a benchmark for comparison, it could take 33 - 270 years before my existing PFOS levels decayed to 18ppt. Referencing the Ecology Center's previous comment stating, "People with high levels of occupational exposure will have an additive source of exposure through their drinking water", as someone who has high levels of PFOS in my body, and as a firefighter is at risk of occupational exposure to PFAS compounds, if I were to consume drinking water containing a MCL of 18ppt of PFOS daily for the remainder of my life, my existing PFOS levels would likely increase, thus reversing the half-life clock.

I'm 50-years old. According to the U.S. Census Bureau life expectancy predictions for Pennsylvanians, I have 28.3 years left, however, I plan on living well past 78.3 years. Understanding there is a difference between water and blood serum concentrations, with the amount of PFOS remaining in my body, and assuming I am never exposed to PFOS again, I may not live long enough to witness my current PFOS levels decay to the PADEP proposed MCL of 18ppt. I most definitely will not live long enough to witness my current levels decay to those like California or Michigan, but rest assured if the PADEP takes the initiative to be just as, if not more stringent than California in establishing low MCLs for PFOA and PFOS compounds, I will die peacefully knowing that future generations will live in a society safer than the one we currently have regarding drinking water.

I admit there is no way of knowing exactly how much PFOA or PFOS compounds my body accumulated prior to my blood test or will accumulate from exposure and consumption of contaminated drinking water from this point on, and that the figures I presented are worst case predictions. However, considering the known toxicity of PFAS compounds, the PADEP must consider worst case scenarios including our vulnerable populations when determining appropriate MCLs for such PFAS compounds.

Of those within the DoD who have had their blood tested, many, after sending me their blood test results, have stated they have been diagnosed with medical illnesses or conditions they and their physician believe are associated to their repeated exposure to AFFF which contains PFAS compounds. The highest blood serum level of PFOS reported to me to date is 30.420

²⁴ Agency for Toxic Substances and Diseases Registry, *Toxicological Profile for Perfluoroalkyls*, Table 1-1, pg. 5, May 2021.

ng/mL, or 30,420ppt. As stated previously, my own blood serum PFOS levels are 22.8 ng/mL or 22,800ppt, 30-years after my first exposure to AFFF. This demonstrates why PFAS compounds are considered “forever chemicals”, they do not decay as quickly as other compounds and remain in our bodies for a prolonged period of time, for some, a lifetime.

PFAS compounds are man-made, they do not naturally occur in our bodies, let alone the environment including water. Many believe an appropriate MCL of zero (0) ppt should be considered. In all fairness, is establishing a MCL of zero for PFAS compounds realistic? I would concur no, simply because of the thousands of consumer products manufactured with PFAS compounds that are in use or discarded in our landfills. Therefore, until technology is invented to completely remove PFAS compounds from our drinking water sources and systems, I would suggest establishing initial MCLs for PFAS (PFOA & PFOS) like those in California or Michigan.

Many states across the country have established MCLs for PFAS compounds much lower than the EPA’s 70ppt LHAs and the PADEPs proposed levels. California for example, established a 5.1ppt MCL for PFOA and 6.5ppt for PFOS; the lowest in the nation, whereas Michigan established an 8.0ppt MCL for PFOA, and a 16ppt MCL for PFOS²⁵. Something to note, despite each state’s best intentions to minimize PFAS contamination by establishing low MCLs, the DoD has and continues to ignore state requirements²⁶ and will continue to do so here in Pennsylvania at current and former military sites where PFAS has been detected.

With the DoD standing firm regarding following PFAS compound removal actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)²⁷, their refusal to abide to state MCLs impacts contaminated current and former military sites across the country and here in Pennsylvania; sites like the Horsham Air Guard Station where 309,700ppt of PFOS+PFOA was detected in on-base groundwater, or Letterkenny Army Depot where 1,009ppt PFOS+PFOA was detected in on-base groundwater²⁸. Other military sites across Pennsylvania have detectable levels of PFAS however, they pale in comparison to the “filthy fifty”, a list of the 50-most contaminated current and former military installations in the United States²⁹. My last assignment in the USAF was at Langley Air Force Base in Hampton, Virginia

²⁵ JD Supra, “State-by-State Regulations of PFAS Substances in Drinking Water”, <https://www.jdsupra.com/legalnews/state-by-state-regulation-of-pfas-9713957/>, (10 June 2021)

²⁶ Foster’s Daily Democrat, “DoD to follow EPA water standards, not more strict state standards”, <https://www.fosters.com/story/news/2019/12/06/dod-to-follow-epa-water-standards-not-more-strict-state-standards/2144144007/>, (5 December 2019)

²⁷ Office of the Secretary of Defense, Memorandum titled: “Department of Defense on Using State Per- and Polyfluoroalkyl Substances Drinking Water Standards in Comprehensive and Environmental Response, Compensation, and Liability Act Removal Actions”, 22 December 2021

²⁸ Environmental Working Group (EWG), “PFAS Contamination in the U.S. (October 4, 2021)”, https://www.ewg.org/interactive-maps/pfas_contamination/map/, (Accessed 22 March 2022)

²⁹ Environmental Working Group (EWG), “At the most contaminated military sites, little to no progress in cleaning up ‘forever chemicals’”, <https://www.ewg.org/news-insights/news/most-contaminated-military-sites-little-no-progress-cleaning-forever-chemicals>, (24 May 2021)

where 2,225,000ppt of PFOA and PFOS was detected in on-base groundwater. Those working and living on and near the military installation were never informed of the contamination.

I mentioned earlier I fall in-line with many military firefighters exposed to PFAS compounds who are now sick. My current medical illnesses and conditions include diagnosed as/with Type II Diabetes, high cholesterol, and high triglycerides to name a few. One might say due to my illnesses and previous exposure to PFAS compounds, I fall within the vulnerable population and that continued exposure or consumption of PFAS compounds could jeopardize my health; I agree. Studies have shown the primary route of PFAS excretion in nonhuman primates and rodents is through urination³⁰. This explains why many military veterans and firefighters are diagnosed with kidney, testicular, and bladder cancer, all believed to be associated with PFAS compound exposure. Sadly, many of my fellow veterans and firefighters have died not knowing how or why they became sick, their families asking questions but receiving no answers.

For me, it's not a matter of if, it's a matter of when; when will I be diagnosed with some form of cancer likely associated with the many years of exposure to PFAS compounds found in consumer products and drinking water. Establishing low PFAS MCLs may not prevent the cancer from occurring within me due to my previous exposure, but it might for someone else.

In closing, I want to thank the PADEP for this opportunity to submit my comments and following highlights and questions on such a critical issue that unfortunately, many believe will not be remediated for generations due to the amount of contamination across the world. The MCLs proposed by the PADEP are a step in the right direction and as such, the Commonwealth should find itself in a position to establish historic changes that will protect the health of Pennsylvania communities while creating a standard for other states to follow. Again, I thank you and offer the following for consideration:

Highlights:

1. Pennsylvania should be leading the United States on establishing the strictest MCLs pertaining to PFAS compounds.
2. 96% of military and DoD civilian firefighters surveyed have elevated levels of PFHxS as well as 51% having elevated levels of PFOS in their blood serum, levels far exceeding the CDC's Geometric Mean (average) among those they surveyed. The CDC NHANES study Geometric Mean for PFHxS is 1.180 ng/mL whereas the DoD Firefighter survey Geometric Mean is 5.019 ng/mL. PFHxS exposure has been associated with impaired reproduction.

It is highly likely that along with PFOA and PFOS, PFHxS is detectable within drinking water and as such, a MCL for PFHxS must be established. In addition, PFBS, PFNA,

³⁰ Agency for Toxic Substances and Diseases, *Toxicological Profile for Perfluoroalkyls*, pg. 581, May 2021.

PFHpA, and other PFAS compounds have been detected in groundwater throughout the United States and as such, must have MCLs established.

Rather than creating separate, potentially confusing MCLs for the thousands of PFAS compounds released into the environment, the Commonwealth, the PADEP, should establish a combined total limit for all the toxic PFAS compounds, instead of limits for each.

3. MCLs must take into consideration how PFAS compounds impact children, elderly, and other vulnerable populations instead of just adults.
 - a. Children, pregnant women, and those suffering from chronic illness and the elderly are the most susceptible to the negative health impacts of exposure to PFAS. By establishing a low MCL, health impacts can be lessened to those individuals.
4. Pennsylvania's PFAS standards must consider the best available research and studies, to ensure the limits are protective of public health.

Questions:

1. As scientific research continues to determine what dosage range of PFAS compounds cause certain medical illnesses or conditions like cancer to develop in the human body (in a controlled environment, we know the dosage range in lab mice, rats, and other animals), and knowing that PFAS compounds build up in the human body and remains there for long periods of time (bioaccumulation), will the Commonwealth, the PADEP, explain to the public how MCLs of 14ppt or 18ppt are acceptable health risks, or will they stand alongside the great citizens of Pennsylvania and establish the most stringent MCLs in the nation to protect current and future generations?

We are not getting younger, so, while we may be healthy today, we will at some point transition to the vulnerable population where PFAS exposure will impact our health.

2. Has the Commonwealth, the PADEP, conducted a study on human health impacts to residents within Pennsylvania, and if so, what are the results of such study?
3. When will the Commonwealth, the PADEP, alert citizens they have or may have been drinking contaminated water?
4. Of the 400 sites tested across the Commonwealth, one-third were found to contain PFAS compounds above the EPA's Lifetime Health Advisory of 70ppt. In Lock Haven, Clinton County, water sources near the former International Paper manufacturing plant were not tested despite evidence that shows papermills in the United States have used PFAS

during their manufacturing process and that sludge from these plants contained PFAS compounds³¹.

With the likelihood a widespread area of Pennsylvania is contaminated with PFAS compounds, and with the proposed lowering of PFAS MCLs, will the Commonwealth, the PADEP, increase the number of sites to be tested to include drinking water sources near the former International Paper mill in Lock Haven; sources that supply a large portion of drinking water to local communities?

5. Knowing the DoD is reluctant to abide to state MCLs, how will the Commonwealth, prepare for and hold the DoD accountable for contamination that originated from their installations and sites?

³¹ Portland Press Herald, *Trail of 'forever chemicals' leads to Maine paper mills*, <https://www.pressherald.com/2021/07/18/trail-of-forever-chemicals-leads-to-maine-paper-mills/>, 2021