conservation law foundation

For a thriving New England

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Via Electronic and U.S. Mail
Robert R. Scott, Commissioner
N.H. Department of Environmental Services
29 Hazen Drive, P.O. Box 95
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Robert.Scott@des.nh.gov

Re: Petition for Rulemaking to Establish a Treatment Technique Drinking Water Standard for Per- and Polyfluoroalkyl Substances

Dear Commissioner Scott:

Conservation Law Foundation (CLF), Merrimack Citizens For Clean Water, New Hampshire Safe Water Alliance, Testing for Pease, and Toxics Action Center (hereinafter Petitioners) hereby petition the Department of Environmental Services (Department) pursuant to RSA 541-A:4 to establish a drinking water standard for Per- and Polyfluoroalkyl Substances (PFAS) that is protective of public health.[1] Petitioners recognize and appreciate that the Department, pursuant to the enactment of SB 309 and HB 1101 last session, is currently working to establish maximum contaminant levels (MCL) for four PFAS: perfluorooctanoic acid (PFOA), perfluoroctanesulfonic acid (PFOS), perfluorononanoic acid (PFNA), and perfluorohexanesulfonic acid (PFHxS). We are supportive of the Department's work in this regard, but we also recognize, as discussed below, that there are now thousands of PFAS requiring regulation to protect the public's health and that a treatment technique approach, rather than a chemical by chemical approach, is warranted.

As set forth herein, Petitioners request that the Department, as soon as practicable, and no later than upon its completion of final rulemaking establishing MCLs for PFOA, PFOS, PFNA and PFHxS, commence rulemaking to adopt and implement a treatment technique drinking water standard for the remaining PFAS in the PFAS class of chemicals.[2] PFAS have been found in drinking water sources across New Hampshire and numerous studies have linked PFAS to significant health risks, including cancer. Although the State of New Hampshire has taken and is

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[1] Pursuant to RSA 541-A:4,I, "[a]ny interested person may petition an agency to adopt, amend, or repeal a rule."

[2] Although this petition has prioritized a drinking water standard for the PFAS class, there is also an urgent need to develop comprehensive standards for PFAS compounds, including but not limited to, surface water quality standards, pre-treatment standards for industrial users, and limits for land application of sludges.

taking preliminary steps to limit exposure to this dangerous class of chemicals, additional affirmative steps are necessary to protect the public from PFAS.

The Petitioners

CLF protects New England's environment for the benefit of all people. Founded in 1966, CLF is a non-profit, member-supported organization with offices located in New Hampshire, Vermont, Maine, Massachusetts, and Rhode Island. CLF uses the law, science, and the market to create solutions that protect public health, preserve natural resources, build healthy communities, and sustain a vibrant economy. CLF has been a leading advocate for clean water and safe drinking water in New Hampshire and throughout New England, and is engaged in numerous efforts to address the threat of PFAS throughout New England, including but not limited to monitoring for PFAS in water bodies near the Coakley Landfill and at the Pease Tradeport and advocating for standards that are more protective than the U.S. Environmental Protection Agency's (EPA) health guidance standard, as adopted by the Department for ambient groundwater quality purposes.

Merrimack Citizens For Clean Water is a grassroots organization, formed in response to the discovery of PFAS drinking water in Merrimack as a result of long-term and ongoing uncontrolled air emissions by Saint Gobain. It is a community-based advocacy and education group with a focus on Merrimack's needs arising from PFAS pollution, including remediation, clean-up, regulation, health support, and polluter accountability.

New Hampshire Safe Water Alliance is a grassroots organization dedicated to assuring clean, safe, uncontaminated drinking water for all New Hampshire residents. The organization believes that uncontaminated water is a human right and is fully committed to ensuring that our children, their children, and generations to come have clean and safe drinking water here in New Hampshire.

Testing for Pease is a community action group, whose mission is to be a reliable resource for education and communication while advocating for a long-term health plan on behalf of those impacted by the PFAS water contamination at the former Pease Air Force Base in Portsmouth, NH.

Toxics Action Center believes that everyone has the right to breathe clean air, drink clean water, and live in a healthy community with a government that operates responsively. Toxics Action Center works to make those rights a reality by working side-by-side with community groups fighting pollution threats in their neighborhoods by providing information, research, networking, and community organizing assistance. Since its start in 1987, it has worked with over 1,000 community groups and 20,000 individuals fighting pollution, including three groups in New Hampshire tackling PFAS drinking water contamination.

Introduction

It is essential that New Hampshire residents be protected from the health threat of PFAS in drinking water. PFAS are persistent in the environment; bioaccumulative; highly mobile in water; found in hundreds of different products; and are toxic in very small concentrations. PFAS have been found at unsafe levels in drinking water in New Hampshire, as well as in ground- and surface waters. Drinking water contaminated with PFAS is a significant source of exposure.[3] Without a drinking water standard, public water systems in New Hampshire are not required to regularly monitor for PFAS compounds or to treat water with unsafe levels of PFAS.

DuPont, 3M, and other chemical manufacturers recklessly produced these dangerous chemicals for decades despite being aware of the significant health risks associated with PFAS. Furthermore, in 1981, 3M and DuPont were aware that ingestion of perfluorooctanoic acid (PFOA) caused birth defects in rats.[4] After receiving this information, DuPont tested seven children of pregnant workers: two had birth defects.[5] DuPont was also aware that at least one facility had contaminated local drinking water supplies with unsafe levels of PFOA by 1991, yet it failed to warn anyone.[6]

DuPont hid this vital health information from the public and the EPA while making billions of dollars in profits from continued production of PFOA.[7] Ultimately, DuPont was fined $16.5 million dollars in 2005 for failing to disclose information about toxicity and health risks cause by PFOA.[8]

Although PFOA and PFOS have now been phased out of production in the United States,[9] these compounds will remain in our drinking water, ground- and surface waters, as well as our bodies, for decades. In addition, manufacturers have rushed to produce thousands of alternative PFAS that are likely to pose similar health risks given the similarities in chemical structure.[10] There are now over 3,000 different kinds of PFAS.

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[3] *See* Vt. Dep't of Health, *Health Department Releases PFOA Blood Test and Exposure Assessment Results*, Jan. 26, 2017, http://www.healthvermont.gov/sites/default/files/documents/2017/01/NEWS_PFOA%20Blood%20Test%20%26%20Exposure%20Assessment%20Results.pdf (noting that "PFOA levels in blood were strongly correlated with PFOA levels in well water.").

[4] Nathaniel Rich, *The Lawyer Who Became DuPont's Worst Nightmare*, N.Y. TIMES, Jan. 6, 2016, https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html.

[5] *Id.*

[6] *Id.*

[7] *Id.*

[8] Memorandum from Grant Y. Nakayama, Assistant Administrator, to Environmental Appeals Board Re Consent Agreement and Final Order to Resolve DuPont's Alleged Failure to Submit Substantial Risk Information Under the Toxic Substances Control Act (TSCA) and Failure to Submit Data Requested Under the Resource Conservation and Recovery Act (RCRA) (Dec. 14, 2005), https://www.epa.gov/sites/production/files/2013-08/documents/eabmemodupontpfoasettlement121405.pdf.

[9] U.S. Envtl. Prot. Agency, *Assessing and Managing Chemicals Under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what.

[10] *See, e.g.*, Stephen Brendel et al., *Short-Chain Perfluoroalkyl Acids: Environmental Concerns and a Regulatory Strategy under REACH*, 30 ENVTL. SCI. EUR. 9 (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834591/pdf/12302_2018_Article_134.pdf.

To make matters worse, EPA has failed to take meaningful action to protect the public from exposure to PFAS in drinking water. After becoming aware of contamination of drinking water supplies and the significant health risks posed by these dangerous chemicals, EPA gave manufacturers almost a decade to phase out production and use of PFOA and PFOS through a voluntary program.[11] Despite learning in 2015 that millions of Americans were, and continue to be, exposed to PFAS-contaminated drinking water, EPA has not taken steps toward requiring public water systems to regularly monitor for PFAS and to treat unsafe water.[12] EPA even suppressed a scientific study suggesting that EPA's current health advisory for PFOA and PFOS does not protect public health.[13]

After widespread public outcry, EPA announced the possibility of setting drinking water standards for just two out of more than 3,000 PFAS, but no enforceable regulatory standard has been proposed to date, and even this limited action will take years.[14]

In addition, the federal government's capacity to set a standard protective of public health has been compromised by the staggering liabilities of the United States for releases of PFAS at federal facilities nationwide.

New Hampshire can—and must—take the lead in the absence of federal safeguards. We will never be able to reverse the damage caused by chemical manufacturers and EPA's inaction, but the Department has the authority to promulgate drinking water rules premised on treatment techniques, as opposed to chemical-by-chemical MCLs, to protect the public health.[15] In the absence of such rules, the public will remain at risk, and the most vulnerable among us—nursing infants and children generally, who consume higher volumes of water for their body weight and have greater developmental susceptibility—will be at the greatest risk.

Moreover, in the absence of such rules, homeowners on well-water and municipalities and other drinking water system operators will be stymied in their efforts to recover the costs of adopting filtration and other safeguards from responsible polluters.

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[11] *See, e.g.*, U.S. Envtl. Prot. Agency, *In the matter of: Premanufacture Notice Numbers: Dupont Company*, April 9, 2009, https://assets.documentcloud.org/documents/2746607/Sanitized-Consent-Order-P08-0508-and-P08-0509.pdf.; Premanufacture Notification Exemption for Polymers; Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 75 Fed. Reg. 4295, 4296 (Jan. 27, 2010).

[12] David Andrews, *Report: Up to 110 Million Americans Could Have PFAS-Contaminated Drinking Water*, ENVTL. WORKING GROUP, May 22, 2018, https://www.ewg.org/research/report-110-million-americans-could-have-pfas-contaminated-drinking-water#.W6_7a2hKg2w.

[13] Abraham Lustgarten, et al., *Suppressed Study: the EPA Underestimated Dangers of Widespread Chemicals*, PROPUBLICA, June 20, 2018, https://www.propublica.org/article/suppressed-study-the-epa-underestimated-dangers-of-widespread-chemicals.

[14] *The Federal Role in the Toxic PFAS Chemical Crisis, Hearing on SD-342 Before the Subcomittee. on Homeland Security & Governmental Affairs*, 115th Cong. (2018) (statement of Chairman Rand Paul and Ranking Member Gary C. Peters), https://www.hsgac.senate.gov/hearings/the-federal-role-in-the-toxic-pfas-chemical-crisis.

[15] RSA 485:3,I(b)(2).

For all of these reasons, the Department should protect the public's health by adopting a treatment technique drinking water standard that will protect New Hampshire residents from the class of PFAS.

I. Background

A. PFAS are harmful to human health.

PFAS are a public health crisis "perfect storm" because PFAS compounds are extremely persistent in the environment, highly mobile in water, bioaccumulative, toxic in very small quantities, and found in hundreds of products. PFAS compounds are man-made substances that do not occur naturally, and they have been used in non-stick cookware, water-repellent clothing, stain resistant fabrics and carpets, cosmetics, firefighting foams, and other products that resist grease, water, and oil.[16] These chemicals are extremely strong and highly resistant to degradation.[17]

PFAS are toxic to humans in very small concentrations—in the *parts per trillion* (ppt).[18] PFAS are suspected carcinogens and have been linked to growth, learning and behavioral problems in infants and children; fertility and pregnancy problems, including pre-eclamsia; interference with natural human hormones; increased cholesterol; immune system problems; and interference with liver, thyroid, and pancreatic function.[19] PFAS have been linked to increases in testicular and kidney cancer in human adults.[20] The developing fetus and newborn babies are particularly sensitive to some PFAS.[21]

Alarmingly, epidemiological studies identify the immune system as a target of PFAS toxicity. Some studies have found decreased antibody response to vaccines, and associations between blood serum PFAS levels and immune system hypersensitivity (asthma) and autoimmune

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[16] Seth Kerschner & Zachary Griefen, *Next Round of Water Contamination Suits May Involve CWA*, LAW 360, October 5, 2017, https://www.law360.com/articles/970995/next-round-of-water-contamination-suits-may-involve-cwa.

[17] New Jersey Dep't of Envtl. Prot. Division of Science, Research, and Envtl. Health, *Investigation of Levels of Perfluorinated Compounds in New Jersey Fish, Surface Water, and Sediment*, June 18, 2018, https://www.nj.gov/dep/dsr/publications/Investigation%20of%20Levels%20of%20Perfluorinated%20Compounds%20in%20New%20Jersey%20Fish,%20Surface%20Water,%20and%20Sediment.pdf.

[18] Agency for Toxic Substances and Disease Registry, *Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, https://www.atsdr.cdc.gov/pfas/health-effects.html; Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf, at 5–6.

[19] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf, at 5–6.

[20] *Id.* at 6; Vaughn Barry et al., *Perfluorooctanoic Acid (PFOA) Exposures and Incident Cancers among Adults Living Near a Chemical Plant*, 121 ENVTL. HEALTH PERSPECTIVES 11-12, 1313-18 (Nov.-Dec. 2013), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855514/pdf/ehp.1306615.pdf.

[21] U.S. Envtl. Prot. Agency, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*, (May 2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf, at 10.

disorders (ulcerative colitis).[22] There are no medical interventions that will remove PFAS from the body.[23]

PFAS "have been detected in all environmental media including air, surface water, groundwater (including drinking water), soil, and food."[24] A study by the Centers for Disease Control and Prevention (CDC) found four PFAS (PFOS, PFOA, PFNA, and PFHxS) in the serum of nearly all of the people tested, indicating widespread exposure in the U.S. population.[25] PFOA and PFOS were found in up to 99 percent of the U.S. general population between 1999 and 2012.[26] PFAS are found in human breast milk and umbilical cord blood.[27]

While a great deal of public attention has recently been paid to PFOA and PFOS, and the New Hampshire legislature has mandated the establishment of MCLs and other action by the Department related to PFOA, PFOS, PFNA and PFHxS, EPA and other scientists have raised concerns that other chemicals in the PFAS class of compounds are similar in chemical structure and are likely to pose similar health risks.[28] For example, all PFAS share a strong carbon-flourine bond and "degrade very slowly, if at all, under environmental conditions."[29] Although some of the long-chain PFAS are being regulated or phased out, the most common replacements are short-chain PFAS with similar structures, or compounds with fluorinated segments joined by ether linkages.[30] While some shorter-chain fluorinated alternatives seem to be less bioaccumulative, they are still as environmentally persistent as long-chain substances or have persistent degradation products.[31] In addition, because some of the shorter-chain PFAS are less effective, larger quantities may be needed to provide the same performance.[32] Thus, drinking water rules must protect the public health from unsafe exposure to all compounds in the PFAS class.

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[22] *Id.* at 39.

[23] Vermont Dep't of Health, *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in Drinking Water*, July 9, 2018, http://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS.pdf.

[24] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, *supra* note 18, at 2.

[25] Ctr. for Disease Control and Prevention, *Per- and Polyfluorinated Substances (PFAS) Factsheet* (Apr. 7, 2017), https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html.

[26] U.S. Envtl. Prot. Agency, *Drinking Water Health Advisory for Perflourooctanoic Acid (PFOA)* (May 2016) at 9, https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf.

[27] Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Perfluoroalkyls*, *supra* note 18, at 3.

[28] *See, e.g.*, U.S. Envtl. Prot. Agency, *supra* note 11 (stating that, with respect to "GenX" compounds (chemical substances intended to replace long-chain (C8) PFAS used in Teflon), "EPA has concerns that these PMN substances will persist in the environment, could bioaccumulate, and be toxic ("PBT") to people, wild mammals, and birds.").

[29] Arlene Blum et al., *The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)*, ENVTL. HEALTH PERSPECTIVES (May 2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1509934.

[30] *Id. See also,* KEMI Swedish Chemicals Agency, *Occurrence and use of highly fluorinated substances and alternatives; Report from a government assignment*, 6-78, 26 (August 9, 2009), https://www.kemi.se/en/global/rapporter/2015/report-7-15-occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf.

[31] Blum, *supra* note 29.

[32] *Id.*

B. PFAS have been found in New Hampshire drinking water, groundwater, and surface waters.

Not only are PFAS toxic in very small amounts (in the nanograms per liter or ppt), they are highly mobile in groundwater and surface water and, as the Department is well aware from its investigations into PFAS problems and collection of data from entities across the state, have been found in waters throughout New Hampshire.[33]

1. Drinking Water

As the Department knows, New Hampshire has experienced significant issues related to the presence of PFAS in drinking water.

In May 2014, PFOA and PFOS were found to be present in a well at Pease Tradeport, with other PFAS subsequently detected at the property, causing the City of Portsmouth to shut down a located at the Tradeport.[34] Also on the Seacoast, the City of Dover, has had to discontinue use of two of its wells – its Griffin and Ireland wells, the latter being the City's most abundant drinking water source – as a result of PFAS contamination;[35] PFAS have been found in drinking water in private wells in the vicinity of the Coakley Landfill Superfund Site and in a public water system in nearby Hampton; and the Rochester Water Department has detected PFOA and PFOS at a combined level of 21.6 ppt in one of its gravel wells.[36]

PFOA was found to be present in private drinking water wells in Merrimack, New Hampshire in March 2016, as a result of pollution from the Saint-Gobain Performance Plastics facility.[37] Residents there have experienced concentrations of PFOA and/or PFOS (individually or in combination) in private wells at levels exceeding the EPA's health advisory level of 70 ppt, resulting in the need for alternative drinking water options,[38] and two Merrimack Valley Water District wells were shut down as a result of PFOA and PFOS contamination. In fact, the impact of pollution from the Saint-Gobain Performance Plastics facility has reached beyond Merrimack, causing the Department to investigate an area that also includes Bedford, Litchfield, Londonderry, and Manchester. As of January 10, 2017, 774 sampling results received as a part of that investigation revealed 551 samples with levels of PFOA and PFOS (in combination) equal to or greater than 10 ppt, with 183 of such samples equal to or greater than 70 ppt.[39]

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[33] *See generally* NHDES PFAS Investigation website, https://www4.des.state.nh.us/nh-pfas-investigation/.
[34] N.H. Dept. of Health and Human Services, *Areas of [PFAS] Investigation in New Hampshire*, https://www.dhhs.nh.gov/dphs/pfcs/pfc-nh-response.htm.
[35] "Dover shuts down one drinking water well due to contamination," Fosters Daily Democrat (July 17, 2018), http://www.fosters.com/news/20180717/dover-shuts-down-one-drinking-water-well-due-to-contamination.
[36] *See* NHDES, *PFOA/PFOS Sampling Results for Public Water Systems in New Hampshire (Updated 5/3/2017)* at 43, https://www.des.nh.gov/organization/commissioner/documents/pfoa-public-water-results-20170503.pdf.
[37] N.H. Dept. of Health and Human Services, *Areas of [PFAS] Investigation in New Hampshire*, https://www.dhhs.nh.gov/dphs/pfcs/pfc-nh-response.htm.
[38] *Id.*
[39] N.H. Dept. of Envt'l Serv., *NHDES State-wide Perfluorinated Chemicals (PFC) in Drinking Water Investigation* (Jan. 10, 2017), https://www.des.nh.gov/organization/commissioner/documents/pfoa-statewide-status-20170110.pdf.

These are but a few examples of PFAS being found in drinking water in New Hampshire.[40] As of June 2018, the Department noted: "we currently have 40 active PFAS drinking water contamination investigations, and are witnessing first-hand the impact that these PFAS contaminants are having on communities and residents in the Granite State."[41] Indeed, sampling has revealed the presence of PFAS in drinking water, as of June 2018, even in three schools – with one such school having levels equal to or greater than 70 ppt, and another at levels equal to or greater than 45 ppt.[42] The PFAS threat to drinking water is significant and widespread and already – even applying the EPA's inadequately protective health guidance standard of 70 ppt – is causing the loss of drinking water resources.

2. Groundwater

The Department's investigation of PFAS contamination in New Hampshire reveals significant and widespread presence of PFAS in groundwater throughout the state, with a level as high as 19,000 ppt PFOA measured at a monitoring well associated with the Saint-Gobain Performance Plastics investigation. *See* May 2018 Unvalidated Groundwater Data Submittal by Saint-Gobain to NHDES (July 13, 2018), Table 1. Indeed, the Department's PFAS map – documenting data collected from across the state – depicts the geographic scope and prevalence of the problem.[43] From Canterbury (up to 1,166 ppt PFOA + PFOS) to the New Hampshire Motor Speedway in Loudon (278.7 ppt), to a location in the area of Webster Place near the Merrimack River (884 ppt) – to name just three of *many* locations – sampling data from across the state reveals the presence of PFAS in groundwater.[44] And, of course, the presence of PFAS in groundwater threatens the safety of drinking water resources and surface waters and, in turn, the public's health.

3. Surface Water

PFAS have also been found to be present at elevated levels in surface waters throughout New Hampshire due to several exposure pathways. First, PFAS can end up in surface waters based on proximity to PFAS-emitting facilities, like the Saint-Gobain Performance Plastics facility in Merrimack. In fact, Saint-Gobain has reported to the Department extremely high levels of PFAS

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[40] It is worth noting that much of the PFAS sampling done for public water supply systems to date has been conducted with analytical detection limits that "vary substantially," including detection limits as high as 40 ppt. Accordingly, data provided to the Department do not all reveal the true conditions, including whether there may be PFAS present at concentrations that would exceed health-based guidance established by other regulators, such as in Vermont. *See* NHDES, *PFOA/PFOS Sampling Results for Public Water Systems in New Hampshire (Updated 5/3/2017)*, https://www.des.nh.gov/organization/commissioner/documents/pfoa-public-water-results-20170503.pdf.

[41] Opinion/Editorial, "Addressing the PFAS Threat to Our Drinking Water – Robert Scott, NHDES Commissioner" (June 18, 2018), https://www.des.nh.gov/media/pr/2018/20180628-drinking-water.htm. *See also NHDES State-Wide Perfluorinated Chemicals (PFC) in Drinking Water Investigation*, *supra* note 39.

[42] *See NHDES State-Wide Perfluorinated Chemicals (PFC) in Drinking Water Investigation*, *supra* note 39. *See also* NHDES, *PFOA/PFOS Sampling Results for Public Water Systems in New Hampshire (Updated 5/3/2017)* at 14, https://www.des.nh.gov/organization/commissioner/documents/pfoa-public-water-results-20170503.pdf (showing 27 ppt PFOA + PFOS).

[43] *See* NHDES PFAS Sampling Map, http://nhdes.maps.arcgis.com/apps/View/index.html?appid=66770bef141c43a98a445c54a17720e2&extent=-73.5743,42.5413,-69.6852,45.4489.

[44] *See id.*

in its stormwater (levels as high as 18,566 ppt for sixteen PFAS compounds combined) and, in turn, extremely high levels of PFAS in surface waters (up to 1,653 ppt in an unnamed brook north of the facility, up to 1,299 ppt in Dumpling Brook, and up to 600 ppt in the Merrimack River).[45] Similarly, first as a result of CLF monitoring, and subsequently through monitoring conducted by the Department and the Coakley Landfill Group, high levels of PFAS have been found in Berry Brook, adjacent to and downstream of the Coakley Landfill in North Hampton. High levels of PFAS also have been found in surface waters near Pease Tradeport, with combined PFOS and PFOA levels as high as 8,000 ppt in Pickering Brook and 7,600 ppt in Watering Spring, just to name two. *See* Meeting Materials from Oct. 10, 2018 Restoration Advisory Board Meeting at the Former Pease Air Force Base at 28 - 29.

Second, because monitoring at landfills has shown high levels of PFAS,[46] it can be reasonably expected that the landfill leachate – the liquid pollutant resulting from water moving through the waste pile – also will contain high levels of leachate. Indeed, in Vermont, the Department of Conservation found elevated levels of PFAS in the leachate of every landfill with an active leachate collection system in that state.[47] This raises significant concerns for such leachate being discharged to surface waters via wastewater treatment facilities. While leachate gets collected and processed along with wastewater at WWTFs before being discharged to surface waters, this does not mean PFAS are removed. To the contrary, according to the Vermont Department of Environmental Conservation, "it is not uncommon to observe higher concentrations of some PFAS in the [wastewater] effluent, then [sic] are observed in the influent," something that has been observed in New Hampshire.[48] Indeed, in recognition of this problem, the Town of Newport, New Hampshire recently determined that it will no longer accept landfill leachate from a facility in Vermont because of the presence of PFAS.

II. The Department should establish a treatment technique drinking water standard for the PFAS class that is protective of human health.

In the absence of federal safeguards, New Hampshire must act to protect drinking water and limit the public's exposure to PFAS. As described below, setting MCLs on a chemical-by-chemical basis does not adequately protect the public from PFAS health impacts. Instead, a treatment

[45] N.H. Dept. of Envt'l Serv., "Elevated Levels of PFAS in Stormwater at the Saint-Gobain Facility (Fourth Post in a Series)" (Sept. 27, 2018), https://www4.des.state.nh.us/nh-pfas-investigation/?p=769.

[46] 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 43.

[47] Vt. Dept. of Envt'l Cosnervation, *Perfluoroalkyl Substances (PFAS) Contamination Status Report* (July 2018) at 9, https://dec.vermont.gov/sites/dec/files/documents/PFAS%20Sampling%20Report%207.10.18%20FINAL.pdf.

[48] Vt. Dept. of Envt'l Cosnervation, *Perfluoroalkyl Substances (PFAS) Contamination Status Report* (July 2018) at 12, https://dec.vermont.gov/sites/dec/files/documents/PFAS%20Sampling%20Report%207.10.18%20FINAL.pdf. Sampling data from the Merrimack, New Hampshire wastewater treatment facility reveals the presence of numerous PFAS in both influent and effluent, with levels of PFBA, PFHxA, PFOA, and PFPEA *higher* in the effluent than in the influent. *See* NHDES Sampling Data from Station ID NH0100161_E and Station ID NH0100161_I, Merrimack WWTF (June 20, 2017).

technique drinking water standard for the class of PFAS is needed. This regulatory approach is authorized by law and technically feasible.

A. The chemical-by-chemical, MCL approach to regulating toxic chemicals is not protective of public health and the environment.

Again, the Petitioners recognize and appreciate the Department's current work to establish MCLs for PFOA, PFOS, PFNA, and PFHxS. Nonetheless, with so many PFAS compounds, the inefficiency and resource-intensity of a chemical-by-chemical regulatory framework for toxic chemicals puts public health at risk. For example, even after the 2016 amendment to the Toxic Substances Control Act (TSCA), "it could take decades to evaluate the 80,000 chemicals already in commerce that have yet to be tested, let alone the 2,000 new chemicals introduced each year."[49] The EPA "still treats each chemical individually, continuing the saga in which similar, but slightly different, chemicals can be regrettably substituted."[50]

This "whack-a-mole" approach is especially troublesome when it comes to setting drinking water standards for emerging contaminants like PFAS, because it is time consuming and expensive to assess them, because it is "technically and financially challenging to identify and reverse environmental and human exposure to PFASs[,]" and because both of these issues are exacerbated by the continual introduction of new PFAS compounds.[51] There are at least 3,000 PFAS compounds in use currently[52] and regulators don't know the names of all PFAS compounds, much less where they are located in their state. Recently developed PFAS are regarded as trade secrets and closely-guarded confidential business information, so manufacturers often do not apply for patents or supply regulators with information about molecular structure or usage.[53]

In light of the thousands of PFAS that have been introduced into commerce, with more introduced each year, establishing MCLs for each PFAS compound is simply not sustainable and precludes regulators from acting quickly enough to protect the public health. Thus, New Hampshire should adopt a treatment technique drinking water standard that protects the public from exposure to unsafe levels of all chemicals in the PFAS class.

B. New Hampshire's current PFAS standards do not protect the public health.

New Hampshire has adopted the EPA's health advisory level of 70 ppt for PFOA and PFOS (individually or in combination) as an ambient groundwater quality standard. This standard is not protective of the public health for two reasons. First, the standard is not adequately protective because it addresses just two of the thousands of compounds in the PFAS class, and

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[49] Joseph Allen, *Stop playing whack-a-mole with hazardous chemicals*, WASH. POST, December 15, 2016, https://www.washingtonpost.com/opinions/stop-playing-whack-a-mole-with-hazardous-chemicals/2016/12/15/9a357090-bb36-11e6-91ee-1adddfe36cbe_story.html?utm_term=.ba3a5ab70fce.

[50] *Id.*

[51] Zhanyun Wang et al., *A Never-Ending story of Per- and Polyfluoroalkyl Substances (PFASs)?*, ENVTL. SCIENCE & TECH., (February 22, 2017) at 2511, https://pubs.acs.org/doi/pdf/10.1021/acs.est.6b04806.

[52] *KEMI Swedish Chemicals Agency, supra* note 30, at 6.

[53] *Id.* at 26.

because even just for PFOA and PFOS (individually or in combination), 70 ppt is simply too high a threshold and must be revised downward, consistent with the health threats associated with PFAS, and consistent with actions other states, such as Vermont, have taken to adopt a more stringent (20 ppt) health standard.

Second, New Hampshire's ambient groundwater quality standard does not protect the public from exposure to unsafe PFAS levels in public water systems. Rather, the current ambient groundwater quality standard is, as the Department has described, "not a drinking water standard but rather an enforceable cleanup standard when contaminants are found."[54] "A drinking water standard (i.e., MCL), on the other hand, is a specific enforceable regulatory standard for public water systems that is focused on the protection of human health for all life stages and exposure periods associated with the ingestion of contaminants in drinking water, and is developed using assumptions about other sources of exposure to the contaminant."[55]

Because of the current inadequacy of regulatory standards for PFAS in New Hampshire, Petitioners have been strongly supportive of efforts in New Hampshire to establish MCLs for PFAS, as well as ambient groundwater quality standards (including more protective ambient groundwater quality standards for PFOA and PFOS than the current 70 ppt standard) and surface water quality standards. An essential part of protecting the public health from this growing class of chemicals, however, requires a new approach – establishing a treatment technique standard to ensure protection of the public health.

C. A treatment technique drinking water standard is appropriate for PFAS.

The Department has broad authority to regulate unsafe chemicals in drinking water.[56] In this case, the unique nature of PFAS demands an alternative approach to chemical-by-chemical regulation through MCLs. Regulation of PFAS as a class and through a treatment technique standard is necessary. There are well-established drinking water treatment technologies that public water systems can install to remove unsafe levels of PFAS from drinking water. There is simply no reason for the Department not to promulgate a treatment-technique drinking water standard for the PFAS class to address this public health crisis "perfect storm."

1. The Agency has the authority to adopt a treatment technique drinking water standard.

The Department is authorized to promulgate "drinking water rules and primary drinking water standards which are necessary to protect the public health and which shall apply to all public water systems" and, as such, has authority to regulate unsafe chemicals in drinking water.[57]

[54] *See supra* note 41, Opinion/Editorial, "Addressing the PFAS Threat to Our Drinking Water – Robert Scott, NHDES Commissioner."
[55] *Id.*
[56] *See* RSA 485:1; RSA 485:3.
[57] RSA 485:3,I.

Following consideration of certain criteria,[58] the Department's drinking water rules and primary drinking water standards shall include for contaminants either a "maximum contaminant level that is acceptable in water for human consumption" or "[o]ne or more treatment techniques or methods which lead to a reduction of the level of such contaminant[s] sufficient to protect the public health, if it is not feasible to ascertain the level of such contaminant[s] in water in the public water system. . . ."[59]

"A treatment technique is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant."[60] Where a treatment technique is selected in lieu of an MCL, the treatment technique must "prevent known or anticipated adverse effects on the health of persons to the extent feasible."[61] EPA has adopted several treatment technique drinking water standards in lieu of an MCL where EPA has determined that it is "not economically or technologically feasible to ascertain the level of [a] contaminant."[62] For example, the Surface Water Treatment Rule is a treatment technique.[63] Under this rule, most public water systems that obtain water from surface water, or groundwater under the direct influence of surface water, must use filters and disinfectants to reduce pathogens.[64] In establishing this rule, EPA had to establish a unique procedure to address the risks posed by a specific contaminant because an MCL would not have been practical or protective of public health due to the unique characteristics of the contaminants.

Similarly, the unique characteristics of the PFAS class pose a public health threat that cannot be adequately addressed with the establishment of an MCL for just PFOA, PFOS, PFNA, or PFHxS or a small number of PFAS chemicals. The Department should develop a procedure that would require installation of specific drinking water treatment technologies under certain circumstances. The Department has multiple options to protect the public from exposure to the PFAS class. For example, the Department could promulgate a rule that requires public water systems to install appropriate treatment technologies where (1) the sum of all measurable PFAS exceeds a conservative threshold level that is protective of public health and takes into account the cumulative impacts of all PFAS chemicals, or (2) the presence of PFAS compounds is

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[58] RSA 485:3,I(b) provides that an MCL, or a treatment technique sufficient to protect the public health, is to be established "[a]fter consideration of the extent to which the contaminant is found in New Hampshire, the ability to detect the contaminant in public water systems, the ability to remove the contaminant from drinking water, and the costs and benefits to affected parties that will result from establishing the standard." PFAS satisfy all of these criteria. First, as discussed in Part I.B, *supra*, the presence of PFAS in water in New Hampshire is widespread. Second, PFAS can be detected in public water systems (though, as discussed in Part II.C.2.i-ii, *infra*, the challenges involved in monitoring for the entire class of PFAS warrant a treatment technique standard). Third, as discussed in Part II.C.3, *infra*, PFAS can be removed from drinking water. Finally, the *benefits* of treating drinking water to eliminate unsafe levels of PFAS (i.e., avoiding the significant public health impacts associated with unsafe exposure to PFAS, as discussed in Part I.A) outweigh the costs of implementing a treatment technique standard.
[59] RSA 485:3,I(b).
[60] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants*, https://www.epa.gov/dwregdev/how-epa-regulates-drinking-water-contaminants.
[61] 42 U.S.C. § 300g-1(b)(7)(A).
[62] *Id.*
[63] U.S. Envtl. Prot. Agency, *How EPA Regulates Drinking Water Contaminants*, *supra* note 77.
[64] U.S. Envtl. Prot. Agency, *Surface Water Treatment Rules, https://www.epa.gov/dwreginfo/surface-water-treatment-rules*.

detected using "non-targeted" laboratory analysis.[65] Another option would be to require a robust source water assessment for PFAS and require treatment where PFAS may be present in the source water. The Department should determine a specific procedure for the drinking water standard through a robust stakeholder process as part of the rulemaking process.

2. Due to the unique characteristics of the PFAS class of compounds, a treatment technique is necessary to protect public health.

i. Regulation of PFAS chemicals as a class is necessary.

Even if the Department were to adopt protective MCLs for PFOA, PFOS, PFNA, and PFHxS, such MCLs would not protect the public from the 3,000 or more other PFAS.[66]

First, in addition to PFOA, PFOS, PFNA, and PFHxS, other PFAS have been found[67] or are being investigated in New Hampshire, with the Department typically analyzing samples for twenty-four PFAS.[68] There are likely many other PFAS in New Hampshire that the Department is simply not aware of yet given the speed and secrecy with which chemical manufacturers have introduced these dangerous chemicals into commerce.[69]

Second, as discussed above, PFAS are similar in chemical structure and some PFAS break down into each other. While long-chain PFAS compounds may be decreasing in the environment due to voluntary phase-outs by manufacturers, "the most common replacements are short-chain PFAS with similar structures."[70] Third, these PFAS chemicals are often found together, and fourth, they are likely to have similar health effects as discussed in Part I.A, above.

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[65] EPA and other scientists have identified "non-targeted" laboratory testing methods to better investigate PFAS contamination. *See, e.g.*, U.S. Envtl. Prot. Agency, *EPA Researchers Use Innovative Approach to Find PFAS in the Environment*, https://www.epa.gov/sciencematters/epa-researchers-use-innovative-approach-find-pfas-environment (noting that non-targeted analysis allows "researchers [to] rapidly characterize thousands of never studied chemical compounds in a wide variety of environmental, residential, and biological media); Karl Leif Bates, *Duke Expert Helps Spearhead State's New Water-Testing Program*, DUKE TODAY, Aug. 8, 2018, https://today.duke.edu/2018/08/duke-expert-helps-spearhead-states-new-water-testing-program (noting that non-targeted analysis is used on the Rhine River in Europe, a drinking water source for 20 million people, to monitor emerging contaminants daily).

[66] KEMI Swedish Chemicals Agency, *Occurrence and use of highly fluorinated substances and alternatives; Report from a government assignment, supra* note 30, at 6.

[67] We are aware, for example, that surface water quality sampling by the Town of Rye has detected the presence of PFAS that include PFBA, PFPeA, PFHxA, PFHpA in local surface waters, *Corresp. from CMA Engineers, Inc. to Michael Magnant, Town of Rye Administrator* (Jan. 3, 2017), and that surface water quality sampling by the Coakley Landfill Group has found the presence of PFAS that include PFBS and PFHpA. *Corresp. from CES, Inc. to Peter Briz, Coakley Project Coordinator* (June 27, 2017). *See also* note 48, *supra.*

[68] NHDES, "Frequently Asked Questions (FAQs) for Sampling and Analysis of PFAS at WMD Sites," https://www4.des.state.nh.us/nh-pfas-investigation/wp-content/uploads/2017/08/External-FAQs.pdf (identifying the following PFAS as typically analyzed in samples collected by the Department: PFBS, PFBA, PFDS, PFDA, PFDOA, PFHPS, PFHPA, PFHxS, PFHXA, PFNA, PFTEDA, PFTRDA, PFOS, PFOA, FOSA, PFPEA, PFUNA, N-ETFOSE, N-MEFOSE, 6:2FTS, 8:2FTS, N-MEFOSA, and HFPODA).

[69] Environmental Working Group Comments on the Agency for Toxic Substances and Disease Registry (ATSDR) Draft Toxicological Profile for Perfluoroalkyls, ENVTL WORKING GROUP (August 20, 2018), https://cdn.ewg.org/sites/default/files/testimony/EWG%20Comments%20for%20ATSDR_Aug20..pdf?_ga=2.236461961.949885036.1539136763-1789323056.1527870942.

[70] Blum, *supra* note 29.

EPA has taken steps to regulate a group of chemicals under the Safe Drinking Water Act.[71] For example, EPA established an MCL for five haloacetic acid disinfection byproducts (HAA5) because it did not have sufficient information regarding (1) the occurrence of individual haloacetic acids; (2) how water quality parameters affect the formation of haloacetic acids; (3) how "treatment technologies control the formation of individual . . . [haloacetic acids]"; and (4) toxicity information for some of the individual haloacetic acids.[72] In light of the unique challenges associated with regulation of these chemicals, EPA promulgated a group MCL even in the absence of complete information about each individual haloacetic acid in order to better protect public health.[73] For these reasons, it is appropriate to regulate PFAS chemicals as a class.

ii. A treatment technique in lieu of an MCL is necessary.

A treatment technique in lieu of an MCL for specific PFAS chemicals or small groups of PFAS chemicals is necessary. As discussed previously, scientists suspect that PFAS chemicals in the class may have similar adverse health effects as the handful of PFAS compounds that have been studied more extensively.[74] EPA has developed targeted test methods for only fourteen PFAS chemicals out of more than 3,000 compounds.[75] Thus, it is simply not economically or technically feasible to ascertain the level of each specific PFAS chemical in the PFAS class that poses a risk to people in New Hampshire.

As the Department knows, establishing an MCL for one compound is resource intensive and time consuming. Adopting a treatment technique drinking water standard for the PFAS class in lieu of establishing MCLs for thousands of PFAS chemicals will require far fewer agency resources and will provide protection from exposure to unsafe levels of PFAS on a much shorter timeline. For all of these reasons, a treatment technique drinking water standard is necessary to protect public health.

3. Treatment technologies are available to remove long- and short-chain PFAS.

There are both established and novel methods to remove and destroy PFAS. While long- and short-chain PFAS may be difficult to treat with any one traditional technology—some new technologies are in development— a "treatment train" of several technologies combining

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[71] *See, e.g.,* Vermont Dept. of Health, *Drinking Water Guidance, Grouping Process for Drinking Water Health Advisories*, Aug. 24, 2018, http://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_ECP_GeneralScreeningValues_Water.pdf.
[72] 63 Fed. Reg. 69390, 69409 (Dec. 16, 1998), https://www.gpo.gov/fdsys/pkg/FR-1998-12-16/pdf/98-32887.pdf#page=1.
[73] *Id.*
[74] KEMI Swedish Chemicals Agency, *supra* note 30.
[75] U.S. Envt. Prot. Agency, *Method 537: Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography /Tandem Mass Spectrometry* 537-2 (EPA/600/R-08/092) (Sep. 2009), http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=ED20973987CE8E7A0E0944E8E31D66BE?doi=10.1.1.645.8401&rep=rep1&type=pdf.

adsorbtion, separation, and destruction in sequence, for example, would be effective in treating drinking water and protecting public health.[76]

Adsorbtion technologies such as granular activated carbon (GAC) and ion exchange "are currently the most commonly encountered interim response measures to achieve immediate compliance with drinking water standards and serve as the benchmark of practicality and effectiveness for other treatment technologies."[77]

While new adsorbtion technologies like organically modified silica adsorbents show promise,[78] GAC has long been used for adsorbtion of chemical pollutants, consistently removes PFOS with an efficiency of more than 90 percent,[79] and is the treatment technique specified in the Safe Drinking Water Act (SDWA) for the control of synthetic organic chemicals:

> granular activated carbon is feasible for the control of synthetic organic chemicals, and any technology, treatment technique, or other means found to be the best available for the control of synthetic organic chemicals must be at least as effective in controlling synthetic organic chemicals as granular activated carbon.[80]

Separation technologies, including reverse osmosis, microfiltration, ultrafiltration and nanofiltration, are highly effective for PFAS removal and can remove PFAS at more than 99 percent effectiveness.[81] "Membrane filtration has several benefits including: achieving continuous separation, low energy consumption, ease of combination with other existing techniques, easy up-scaling, and low chemical costs."[82] Ozofractionation (a patented process by the company EVOCRA and available commercially as Ozofractionative Catalyzed Reagent Addition (OCRA)) is a novel separation technology that shows high (greater than 99.99 percent reduction) effectiveness for PFAS.[83]

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[76]It is our understanding that combined treatment techniques for PFAS at the Pease Tradeport's Site 8 – resin followed by GAC – are resulting in non-detect levels of PFOA and PFOS. It is our further understanding that this combination extends the life of carbon in the GAC treatment technique and that it has the the added benefit of addressing short chain PFAS compounds.

[77] J. Horst et al., *Water Treatment Technologies for PFAS: The Next Generation,* 38 GROUNDWATER MONITORING & REMEDIATION (Spring 2018), at 15.

[78] *Id.* at 15–16.

[79] K.H. Kucharzyk et al., *Novel treatment technologies for PFAS compounds: a critical review* 204 JOURNAL OF ENVTL. MANAGEMENT (December 2017), at 759; 42 U.S.C. § 300g-1(b)(4)(D), 759.

[80] 42 U.S.C. § 300g-1(b)(4)(D).

[81] Kucharzyk et al., *supra* note 79 at 759–60; Horst, *supra* note 77.

[82] V.A. Arias Espana et al., *Treatment technologies for aqueous perfluorooctanesulfonate (PFOS) and perfluorooctanoate (PFOA): A critical review with an emphasis on field testing*, ENVIRONMENTAL TECHNOLOGY & INNOVATION (2015), at 168, 177.

[83] Horst, *supra* note 77, at 17.

Finally, novel destructive treatment technologies for PFAS are becoming available. Destructive technologies include sonochemical decomposition,[84] chemical/advanced photochemical oxidation,[85] and AECOM's DE-FLUORO™ technology.[86]

This treatment train solution will also confer significant co-benefits for public health, because the same technologies that are effective in PFAS treatment are effective in removing a host of other dangerous chemicals. GAC adsorbtion filters alone, for example, are effective in removing dozens of harmful contaminants in addition to PFAS (including, but not limited to: RDX, arsenic, benzene, cryptosporidium, MTBE, mercury, perchlorate, tetrachloroethylene (Perc), and trichloroethylene (TCE)).[87] Other technologies that should be considered as components of the treatment train confer similar co-benefits; for example, membrane separation technologies like reverse osmosis treat not only PFAS but also, without limitation, 1,4-dioxane, alachlor, chromium, malathion, and nitrates.[88]

For all these reasons, Petitioners urge the Department to initiate a rulemaking for a treatment technique drinking water standard for the PFAS class.

III. In the alternative, the Department should adopt an MCL for the PFAS class.

The Department must take action to establish drinking water standards for PFAS in the absence of federal safeguards even if the Department does not establish a treatment technique standard. PFAS are present in New Hampshire waters and are known to cause adverse health effects. Thus, at a bare minimum, the Department should, if it elects to not establish a treatment technique standard, adopt an MCL for the PFAS class as a whole.

CONCLUSION

For all the forgoing reasons, Petitioners request the Department establish a drinking water standard for PFAS that is protective of public health. More specifically, the Petitioners request the Department – as soon as practicable, and no later than upon establishment of MCLs for MCLs for PFOA, PFOS, PFNA, and PFHxS – initiate rulemaking to establish a treatment technique drinking water standard for the PFAS class (or, in the alternative, establish an MCL for the PFAS class). We further request, should the Department believe it lacks any needed authority to establish a treatment technique standard or MCL for a class of chemicals such as PFAS, that it immediately seek such authority. The Petitioners will be pleased to assist in such an effort.

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[84] Espana, *supra* note 82, at 174.
[85] *Id.* at 178.
[86] AECOM, *AECOM's Promising New PFAS Treatment Technology DE-FLUORO Shows Complete Destruction of PFAS*, https://www.aecom.com/content/wp-content/uploads/2018/04/PFAS-Treatment-Technology-DE-FLUORO_INFO-SHEET.pdf.
[87] U.S. Envtl. Prot. Agency, *Drinking Water Treatability Database*, *Granular Activated Carbon*, https://oaspub.epa.gov/tdb/pages/treatment/treatmentContaminant.do.
[88] *Id.*

The significant threats posed to human health and the environment by the PFAS class of compounds are clear. We appreciate the work the Department is currently undertaking to establish MCLs for four PFAS and urge it to take action to address all PFAS compounds to protect the public from further exposure to this harmful class of chemicals. Thank you for your consideration.

Sincerely,

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Laurene Allen, LICSW
Merrimack Citizens For Clean Water

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