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The Honorable Michael Regan
Administrator
U.S. Environmental Protection Agency
Mail code: 1101A
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Re: PFAS Action Plan Recommendations from EPN

Dear Administrator Regan:

Congratulations again on your confirmation! Thank you so much for your commitment to repairing the damage of the past administration and to advancing bold new initiatives on climate change and environmental justice. As the Executive Director of the Environmental Protection Network (EPN), an organization comprised of over 550 U.S. Environmental Protection Agency (EPA) alumni volunteering their time to protect the integrity of EPA and its mission, I am writing in support of your priority to address the serious health impacts of per- and polyfluoroalkyl substances (PFAS) chemicals in the environment.

EPN is concerned that EPA's current PFAS Action Plan, developed by the Trump administration, is short on measures to reduce exposures to PFAS and will not help us transition away from this harmful class of chemicals. To date, the plan has not resulted in additional health protections nor risk reductions, and lacks a coherent framework for comprehensively addressing the health and environmental impacts of PFAS as a class. EPN believes that a new, more proactive PFAS Action Plan that moves beyond the current approach to PFAS regulation is needed. To guide development of a new plan, we propose an alternative approach that would implement a systematic process for gathering data on PFAS chemicals as a class; prevent introduction of new PFAS and new uses of existing PFAS; address existing PFAS products and raw materials as a class, with the aim of eliminating all PFAS non-critical uses; reduce environmental releases to the extent feasible; and assure the development of information and data to understand the health risks to communities with historical and ongoing exposure to these chemicals.

As EPA develops an improved plan, we hope you will consider the recommendations we have attached to this letter. In drafting this alternative PFAS Action Plan, we reached out to and received input from many environmental and public health organizations active in PFAS issues in an attempt to identify every authority EPA currently has to prevent new health impacts and reduce current health impacts from these toxic chemicals. We hope our recommendations will assist the agency in moving forward quickly to develop a new PFAS Action Plan. We look forward to discussing the details of the plan with your senior leadership team.

Respectfully submitted,

Michelle Roos
Executive Director
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Cc:
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PFAS Action Plan Recommendations from EPN

April 26, 2021

The Environmental Protection Network (EPN) is an organization of almost 550 U.S. Environmental Protection Agency (EPA) alumni volunteering their time to protect the integrity of EPA, human health, and the environment.

Introduction

EPN is concerned that EPA's current per- and polyfluoroalkyl substances (PFAS) Action Plan (the Plan), developed by the Trump administration, is short on measures to reduce exposures to PFAS and transition away from this harmful class of chemicals. To date, the Plan has resulted in little actual health protection and risk reduction, and lacks a coherent framework for comprehensively addressing the health and environmental impacts of PFAS as a class. The manufacturing, use, and environmental release of most PFAS will continue for the foreseeable future if EPA continues to base decisions solely on the current Plan. While certain high-profile substances with validated analytical methods and toxicity data would receive attention, the bulk of PFAS would not be addressed. This would doom additional generations of Americans to exposure to these high-risk chemicals without any effective regulation and health protection by EPA.

EPN believes that a new, more proactive PFAS Action Plan that moves beyond the current failed approach to PFAS regulation is needed because current research finds that the chemicals pose immunological, developmental, reproductive, hepatic, renal, hormonal, and carcinogenic effects. To guide development of a new Plan, we propose an alternative approach that would implement a systematic process for gathering data on PFAS chemicals as a class; prevent the introduction of new PFAS and new uses of existing PFAS; address existing PFAS products and raw materials as a class, with the aim of eliminating all PFAS non-critical uses; reduce environmental releases to the extent feasible; and assure the development of information and data to understand the health risks to communities with historical and ongoing exposure to these chemicals.

PFAS Health Effects

PFAS have been produced since the 1940s for use in a broad range of consumer products and industrial applications. EPA's most recent PFAS Master List of PFAS Substances identifies 9,252 chemicals, clearly highlighting the challenges of an individual chemical approach to regulation. Many more PFAS are formed as byproducts or impurities during the manufacture of PFAS-based products and degradation/reformation in the environment and are found in waste streams, water discharges, and air emissions to which communities are exposed. The recent finding of PFAS in pesticide containers leaching into pesticides poses a potential new source of PFAS contamination of crops, homes, and public spaces where these pesticides are applied.

In response to concerns about long-chain PFAS chemicals such as perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), and perfluorohexane sulfonate (PFHxS) detected both in the environment and in human biomonitoring studies, industry began developing short-chain PFAS alternatives. While some of these short-chain PFAS chemicals are comparatively less bioaccumulative than the long-chain chemicals, they are equally persistent and even more mobile, also produce adverse health effects, and can build up in the environment and the human body with continuous or repeated exposure. People are exposed to both long- and short-chain PFAS through ingestion, dermal contact, and inhalation via food, water, dust, soil, and consumer products. Studies of both long- and short-chain PFAS have found immunological, developmental, reproductive, hepatic, renal, hormonal, and carcinogenic effects, among others. A recent study found evidence that PFAS exposures increase the severity of the coronavirus in individuals. The Centers for Disease Control and Prevention (CDC) is investigating the impact of PFAS exposure on coronavirus infections by measuring PFAS serum concentrations in healthcare personnel and first

responders and looking for an association between these serum concentrations and the risk of coronavirus infection and subsequent COVID-19. The National Institute of Environmental Health Sciences (NIEHS) is also providing funding for researchers to study the impact of environmental exposures to pollutants, including PFAS, on coronavirus infections. Even those PFAS polymers that are described as nontoxic are made using toxic monomers and processing aids that can be released during production, use, and/or disposal.

The European Union (EU) decided that, based on their persistence and other harmful properties, PFAS chemicals should be subject to the same generic risk management approach as carcinogens. The EU's generic approach for carcinogens is to ban them from most consumer products and for uses that expose vulnerable groups, allowing only limited exceptions for "essential uses" as defined under the Montreal Protocol. The Montreal Protocol defines "essential uses" as those necessary for health, safety or the critical functioning of society when there are no safe alternatives acceptable from the standpoint of the environment and public health. In the U.S., section 6(g) of the Toxic Substances Control Act (TSCA) creates a similar process for exempting "critical or essential use[s]" from risk management rules.

Critique of EPA's PFAS Action Plan

EPA's 2019 PFAS Action Plan focuses on regulating the long-chain carboxylate and sulfonate chemistries (including PFOA and PFOS) because analytical methods and toxicity data are already available for these substances. Even with this limited focus, progress in regulating long-chain substances has been slow. Since 2002, EPA has finalized only four significant new use rules (SNURs) under the TSCA that ban the manufacture or import of long-chain chemistries without advance notice to and review by EPA. These SNURs do not cover all long-chain PFAS and still allow the import of products containing these chemicals, with the exception of carpets and articles with surface coatings containing certain PFAS.

EPA has exempted hundreds of new PFAS chemicals from TSCA premanufacture notice (PMN) requirements and has inadequately restricted GenX and many other new PFAS chemicals regulated under section 5(e) after PMN submission. EPA took two years developing groundwater cleanup guidance for PFOA and PFOS that failed to identify an emergency removal level; spent two years drafting an advance notice of proposed rulemaking (ANPR) asking for public comments on whether the agency should designate PFOA and PFOS as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA); and last year began a five-year process to develop a drinking water standard for PFOA and PFOS.

Beyond PFOA and PFOS, progress in developing analytical methods and toxicity assessments for PFAS chemicals has been slow, and short-chain PFAS have received limited attention. EPA lacks a systematic, cross-program process to select PFAS chemicals for analytical method and toxicity assessment development. Those selected to date represent a small fraction of all PFAS used commercially and found in the environment, and EPA's work on these substances will provide limited support for regulation by the air, water, and solid waste programs.

The Plan also lacks a prospective process using TSCA Section 4 test orders to gather analytical methods and toxicity data from industry. Instead, the Plan puts the burden of developing analytical methods and toxicity assessments on EPA. To date, EPA only has analytical methods for 29 PFAS in drinking water while private laboratories are testing for 70 PFAS. EPA has not yet finalized analytical methods for PFAS in air, surface/ground water, and wastewater. EPA has also not certified a non-target method, such as Total Organic Fluorine (TOF) or Total Oxidizable Precursor Assay (TOPA), despite the fact that many commercial labs routinely use these methods. While EPA plans to develop a TOF method in 2021, the agency states in its unregulated contaminant monitoring rule that a TOF method will not be available for monitoring drinking water during the required time period of 2023 to 2025. A test method for 30 PFAS

chemicals in air was just released, but no TOF or TOPA air test method is yet available to gauge the potential for reformation of PFAS compounds after emission from the stack.

The toxicity assessment for GenX proposed in 2018 is still not final, and the assessment for Perfluorobutanesulfonic acid (PFBS) proposed in 2018 was finalized in January 2021 over the protest of the original authors. The Biden administration withdrew that flawed PFBS assessment in February 2021 based on political interference in its findings. Assessments for five other PFAS chemicals Perfluorodecanoic Acid (PFDA), Perfluorononanoic Acid (PFNA), Perfluorohexanoic Acid (PFHxA), Perfluorohexane sulfonate (PFHxS), and Perfluorobutanoic Acid (PFBA) have been underway for three years but not yet made available.

Under the Clean Water Act (CWA), EPA's effluent limitation guidelines program identified five industry sectors discharging PFAS chemicals to municipal wastewater treatment plants or to surface waters. On January 15, 2021, EPA released an ANPR that will initiate a detailed study of one of these five sectors: organic chemicals, plastics, and synthetic fibers manufacturing. It typically takes the effluent limitation guideline program six years from the time a detailed study is initiated until a final rule is promulgated, setting technology-based permit limits on pollutant discharges for an industry sector. That six-year process will have to be repeated for each of the four other industry sectors identified by EPA as PFAS dischargers (airports, rug and textile manufacturers, pulp and paper manufacturers, and metal finishing industries).

While we have enough information on the persistence, mobility, and toxicity of PFAS chemicals to generally support class-based regulation of these chemicals, EPA has made little progress in developing the health effects data on individual chemicals necessary to understand the impacts of past, current, and future exposure from PFAS manufacture, use, and disposal/environmental release. As a result, communities have been subjected to largely undefined risks, and medical professionals have been deprived of the ability to treat PFAS-related health conditions. The limited industry-sponsored health effects research that has been conducted is often declared confidential business information (CBI) and is unavailable to the public or local and state environmental regulators.

Unfortunately, during the Trump administration, EPA failed to use its authority under Section 4 of TSCA to require PFAS manufacturers to conduct testing and to make the results of that testing publicly available. To address this information need, on October 14, 2020, six North Carolina non-profit groups filed a petition under Section 21 of TSCA requesting that the agency require health and environmental effects testing on 54 PFAS being manufactured by The Chemours Company (Chemours) at its chemical production facility in Fayetteville, North Carolina. On January 7, 2021, the Trump EPA denied the North Carolina petition. In March, 2021, the petitioners asked the Biden administration to reconsider the petition denial, grant the petition, and require Chemours to fund testing on the 54 PFAS. Granting the petition would be consistent with the commitments made in the Biden-Harris campaign's Environmental Justice Plan and by EPA Administrator Michael Regan during his confirmation to make environmental justice and addressing PFAS in frontline communities top priorities in the new administration.

New PFAS Action Plan

Clearly, EPA cannot adequately protect the American public if its actions are based solely on the current PFAS Action Plan. EPN, therefore, recommends that EPA immediately initiate the development of a new PFAS Action Plan, which quickly puts in place a comprehensive framework for addressing the PFAS class. The new PFAS Action Plan should be designed to achieve the following goals: 1) develop and implement a systematic process for obtaining necessary data on PFAS; 2) stop or severely restrict the introduction of new PFAS and new uses of existing PFAS; 3) eliminate all non-critical uses of existing PFAS; 4) prevent exposures to legacy or existing PFAS in the environment; 5) fill important gaps in scientific understanding so that the health impacts on communities of historical and current PFAS exposure can be meaningfully

evaluated; and 6) establish strong collaboration across the agency to implement this comprehensive approach. EPA should not stop or redirect any ongoing work on PFAS until the new Plan is fully developed and ready to be implemented.

Developing a Strong Information Base on PFAS

EPA should implement a systematic process for gathering and making public research data on PFAS that provides a sound basis for identifying all PFAS in products and the environment, detecting and quantifying their presence in critical matrices, determining their mobility and fate in the environment, and integrating available toxicity data. This process should aim to supplement the research being done by the federal government and academic investigators with data developed by the companies manufacturing and processing these chemicals.

First, as required by the FY2020 National Defense Authorization Act (NDAA), EPA should expeditiously promulgate a reporting rule under TSCA section 8(a) requiring all companies manufacturing, processing, or using PFAS (including impurities and byproducts) to: 1) identify the ongoing uses of these chemicals; 2) characterize the facilities manufacturing, processing or using these chemicals (number of workers, processing method, chemical levels in products, etc.); and 3) identify worker and consumer exposures (inhalation, dermal, ingestion) and environmental releases (water discharges, air emissions, disposal method). While the NDAA required promulgation of this reporting rule by 2023, EPA should issue it as soon as possible. We understand that a draft reporting rule is now undergoing Office of Management and Budget (OMB) review and support EPA efforts to expedite this rulemaking. In addition, industry will begin reporting in July 2021 on 172 PFAS subject to EPA's Toxic Release Inventory (TRI) as well as any new PFAS covered by the June 2015 SNUR. This reporting should be comprehensive since no PFAS chemicals will be subject to *de minimis* reporting exemptions under TRI.

EPA also has databases for the Chemical Data Reporting Rule (CDR) and Enforcement and Compliance History Online (ECHO) that have information on industrial sources of PFAS. The Department of Defense (DoD) has developed an open library fingerprinting the source of PFAS chemicals. State attorneys general who have sued PFAS manufacturers have collected a significant amount of data.

EPA should also require TSCA section 8(d) reporting by industry of all unpublished health and safety studies on PFAS. EPA should then systematically review all published and unpublished data on these PFAS chemicals to determine whether the agency should require additional testing to fill data gaps. To obtain missing information, EPA should issue testing orders under Section 4 that would require industry to provide analytical methods, physico-chemical properties data, information on fate and transport, ecotoxicity and health effects data, and bio-monitoring and environmental monitoring studies. TSCA section 8(e) reports should also be used as an important source of toxicity information. Once this information is provided by industry, EPA would make it publicly available to support regulation by states or EPA under air, water, and solid waste statutes.

EPA must begin requiring industry to submit chemical standards for their PFAS chemicals and to submit or develop analytical methods on individual PFAS. EPA must accelerate its efforts to develop both PFAS mixture analytical methods and mixture toxicity assessments for all key media. Mixture methods should include TOF to identify the presence of the carbon-fluorine bond, TOPA to reveal the presence of any perfluorinated carboxylic acid (PFCA) or perfluorosulfonic acid (PFSA) precursors by oxidative conversion, and non-targeted gas chromatograph mass spectrometer analyses to identify all compounds present. Mixture methods should also include the Particle-Induced Gamma-Ray Emission (PIGE) spectroscopic method currently used to detect fluorine on the surface of materials if researchers are successful in modifying it to detect fluorine in water and soil.

Preventing the Introduction of New PFAS and New Uses of Existing PFAS
Commercializing new PFAS and new uses of existing PFAS should be prohibited under TSCA because allowing these activities would magnify PFAS exposure and environmental release at a time when the priority should be to reduce risks.

EPA should issue guidance outlining data requirements for PFAS PMNs that are comprehensive and provide a basis for issuing orders under TSCA Section 5 prohibiting introduction of new PFAS pending completion of testing and review of the results. EPAshould also announce that it is no longer approving applications to exempt new PFAS from PMN requirements. PMN exemption rules provide EPA authority to reject exemption applications for substances that may present risks to health and the environment and, because of the serious concerns raised by PFAS as a class, no new PFAS should be eligible for expedited approval under these rules.

We now have a much higher level of concern about the risks posed by PFAS than when new PFAS were previously reviewed under the PMN program. It is clear that the data requirements imposed in section 5(e) orders allowing short-chain PFAS to be manufactured were inadequate to prevent public health risks and that these orders insufficiently restricted manufacture, use, and disposal of these substances. EPA should review existing section 5(e) orders for PFAS and update them if not sufficiently health protective, especially for susceptible populations. EPA's failure to require adequate restrictions on GenX before its commercial introduction is a clear example of the inadequacy of the current new chemical review process. The hundreds of PMN exemptions previously granted for PFAS should also be reviewed and revoked or modified where warranted.

To prevent new uses of existing PFAS, EPA should first focus on chemicals that are "inactive" on the TSCA Chemical Substance Inventory because they are no longer being manufactured or processed in the U.S. EPA should promulgate SNURs for all inactive PFAS in order to prevent resumption of manufacture and use without providing the agency advance notice and an opportunity to restrict or prohibit new uses. In addition, similar SNURs should be developed for all discontinued uses of PFAS (short chain and long chain) that are "active.". The upcoming TSCA section 8(a) rule should be valuable in identifying uses of PFAS that are not now occurring.

Eliminating Non-Critical Uses of Existing PFAS
The quickest way to eliminate non-critical uses of existing PFAS would be for Congress to pass legislation banning uses that do not meet the TSCA section 6(g) definition of "critical or essential use." TSCA defines a "critical or essential use" as one for which: 1) no technically and economically feasible safer alternative is available, taking into consideration hazard and exposure; 2) restriction would significantly disrupt the national economy, national security or critical infrastructure; or 3) this use, compared to reasonably available alternatives, provides a substantial benefit to health, the environment, or public safety. EPN believes these criteria can be used effectively to differentiate between non-critical uses that should be banned and critical uses that should be allowed subject to restrictions to protect health and the environment.

In the absence of such legislation, the new PFAS Action Plan should commit EPA to using its existing authority to stop or restrict non-critical uses through the TSCA three-step process of prioritization, risk evaluation, and risk management. EPA should use its authority under TSCA section 26(c) to treat PFAS as a "category" for purposes of implementing this process. Under section 26(b)(2), "category" treatment is warranted if chemicals are "similar in molecular structure, in physical, chemical or biological properties, or in mode of entrance into the human body or into the environment" or "in some other way are suitable for classification as such for purposes of this Act." PFAS meet these criteria because of their similarities in persistence, mobility, and toxicity and the potential for all PFAS to cause the same adverse effects as well-characterized compounds such as PFOA and PFOS.

Thus, EPA would have a sound basis to list the entire PFAS category (or appropriate subcategories) as high priority under section 6(b(1), triggering the next step in the TSCA process, conducting a risk evaluation under section 6(b)(4) to determine whether the category presents an unreasonable risk of injury to health and the environment. This determination would not require an assessment of toxicity and exposure for each category member, but could be based on available data for representative PFAS that would then be applied to other chemicals in the category based on their common characteristics and similar conditions of use, exposure, and environmental release.

Following a determination of unreasonable risk, EPA would be required by TSCA to conduct a risk management rulemaking for the category under section 6(a). TSCA authorizes a broad range of risk management options, including prohibition of manufacture and importation and a ban on all or some uses. These remedies would likely be warranted for PFAS as "necessary" to assure that they no longer present an unreasonable risk, as specified in TSCA section 6(a). EPA could conclude that any more limited restrictions would not be effective in preventing the accumulation of PFAS in people and wildlife, their mobility and distribution in the environment, and their harmful health and environmental effects.

Under TSCA section 6(g), EPA has the ability to grant critical use exemptions as part of its risk management rulemaking. As discussed above, the section 6(g) criteria for critical uses are well-constructed and appropriate for identifying PFAS uses that serve important functions warranting exemption from a general ban on the PFAS category. Such exemptions would need to have time limits and other conditions to protect health and the environment. EPN recommends that EPA consider the need for temporary exemptions from risk management on a sector-by-sector basis, allowing for an orderly review of the various functions served by PFAS within the sector, the availability of alternatives, and the economic and environmental profile of each alternative.

EPN recognizes that many states have demonstrated leadership in addressing concerns about PFAS and have moved toward restrictions on uses of PFAS based on a class approach. It is critical not to stifle state initiative and innovation. If states can move more quickly than EPA to ban or restrict non-critical uses of PFAS chemicals, EPA should grant waivers from state preemption while the agency is conducting the risk evaluation and risk management process for the PFAS category. Section 18(f) of TSCA provides a mechanism for granting such waivers. EPA's risk management rules would then apply only to states lacking laws banning or restricting non-critical uses that provide protection equal to or greater than the federal requirements.

Preventing Exposures to Legacy or Existing PFAS in the Environment

In order to prevent the public's exposure to legacy or existing PFAS in the environment, EPA's new PFAS Action Plan should incorporate a broad multi-media strategy that quickly results in coordinated action across the agency's statutes for surface water, drinking water, air emissions, waste management, and remediation. This strategy should identify the most efficient ways to identify and regulate PFAS discharges to air, water, and land. A key goal will be to evaluate whether a single rule requiring multiple industries to control PFAS releases to the environment can be promulgated or whether individual rules must be developed for each industry sector.

Surface Water Discharges: EPA already has adequate data to prove that the water solubility of PFAS chemicals allows them to pass untreated through most municipal wastewater treatment processes. PFAS chemicals have been found in both the effluent and biosolids of municipal wastewater plants. In fact, some of these plants have been found to have higher effluent PFAS concentrations than influent concentrations due to the formation of short- and long-chain PFAS from precursor compounds within the plant. EPA should take action as soon as possible under the CWA to prevent Publicly Owned Treatment Works

(POTWs) from accepting PFAS contaminated wastewater from industries and contaminated leachate from landfills by setting national pretreatment standards.

EPA should also initiate a Targeted National Sewage Sludge Survey (TNSSS) to assess the prevalence of PFAS chemicals in biosolids in order to determine if there should be a moratorium on applying biosolids to agricultural land. The last TNSSS conducted was in 2009 and did not include PFAS. EPA should also update the national biosolids rule to require testing for PFAS chemicals.

In addition, EPA must accelerate monitoring and setting limits on PFAS in wastewater that industries discharge directly into surface waters. Under the CWA, technology-based permit limits on both indirect and direct dischargers can be promulgated as effluent limitation guidelines, but these guidelines have always been designed individually for each industry sector. EPA should evaluate if PFAS effluent limitation guidelines can be promulgated for multiple industry sectors at the same time. EPA must also recommend that whenever the states or EPA require PFAS monitoring in wastewater permits, they also require TOF measurements in order to support the development of statistical relationships between PFAS chemicals and TOF so eventually inexpensive TOF measurements could substitute for expensive PFAS measurements.

While promulgating technology-based permit limits for point sources under the effluent limitation guideline program, EPA must also develop human health and aquatic life water quality criteria for PFAS chemicals. These water quality criteria are needed to determine if the technology-based limits adequately protect human health and aquatic life or if more stringent water quality-based limits are needed. Water quality criteria are also needed to evaluate the impact of nonpoint sources of PFAS chemicals on human health and aquatic life.

EPA should investigate whether water quality criteria can be developed for mixtures of PFAS chemicals or only for individual PFAS chemicals based on currently available data. If currently available data are not adequate to support a mixtures approach, EPA should initiate data collection to support this approach. In addition, EPA should investigate whether water quality criteria for TOF concentrations can be developed as an indicator for PFAS chemicals, just as *E. coli* and *Enterococcus* water quality criteria were developed as indicators of harmful viruses and pathogens. EPA used monitoring data to identify the relationship between *E. coli*/*Enterococcus* and harmful bacteria/viruses and then established water quality criteria for *E. coli* and *Enterococcus* to avoid developing criteria for each individual harmful virus and bacteria. TOF water quality criteria could similarly be used to establish water quality-based permit limits for wastewater discharges without requiring water quality criteria for each individual PFAS chemical to be developed if EPA could demonstrate the relationship between TOF and PFAS. EPA must also revise the agency's National Aquatic Resource Surveys (NARS) to gather the data needed to support the development of mixtures of PFAS and TOF water quality criteria and work with the U.S. Geological Survey to ensure their PFAS monitoring program is designed to gather the same data.

Drinking Water Protection: To educate the public and provide technical support to states and utilities on PFAS concentrations of concern in drinking water, EPA should use its authority under the Safe Drinking Water Act (SDWA) to propose and finalize drinking water health advisories for PFAS chemicals or mixtures as soon as toxicity assessments are completed. It has taken far too long to begin development of drinking water standards for PFOS and PFOA, and other PFAS have not yet been identified for possible regulation under the SDWA despite the large number of PFAS contaminants found in drinking water by states, federal agencies, universities, and private groups.

In addition, because the rulemaking process under SDWA is lengthy and cumbersome, EPA should consider using its emergency authority for "urgent threats to public health" to promulgate an interim national primary drinking water regulation for PFAS after consultation with the Secretary of Health and Human Services. Under this emergency authority, EPA could promulgate an interim regulation as an Maximum

Contaminant Level (MCL) or as a treatment technique. An interim national drinking water MCL for PFAS mixture could be based on EPA methods 533 and 537.1 plus TOPA/TOF. An interim national drinking water treatment technique could be based on granular activated carbon (GAC) or reverse osmosis and the same analytical methods as for the MCL approach. If EPA chooses instead to only regulate certain specific PFAS, it should at a minimum establish standards as expeditiously as possible for those PFAS chemicals and mixtures with completed toxicity assessments.

When finalizing the 2021 proposed Unregulated Contaminant Monitoring Rule 5 (UCMR 5), EPA should add TOF to the list of compounds monitored in order to support the development of statistical relationships between PFAS chemicals and TOF. EPA should also reevaluate the minimum detection limits required for the PFAS chemicals in UCMR 5, which are considerably higher than the limits commercial laboratories currently achieve and may significantly underestimate the risks of PFAS in the nation's drinking water.

Air Emissions: Air emissions from facilities manufacturing or using PFAS are a significant contributor to human exposure, particularly in communities located near these facilities. Title III of the CAA provides several mechanisms for controlling emissions that have no application to PFAS because these substances are not listed as hazardous air pollutants (HAPs). EPA can change this by designating PFAS as a class as HAPs and then developing technology-based (and if necessary health-based) emission control standards. These standards could be developed for individual industry sectors (the traditional EPA approach) or for a combination of sectors together. EPA should also standardize air TOF and TOPA methods to monitor whether PFAS chemicals reform after emission from a stack.

Waste Management: To ensure the safe disposal of PFAS chemicals under RCRA, EPA should evaluate whether it is more efficient to list specific waste sources as hazardous or to list a group of PFAS chemicals as hazardous. Once these sources or chemicals are listed as hazardous, EPA will be required to promulgate land disposal restrictions within six months of the final listing. Safe storage of these hazardous wastes will also be regulated under RCRA. Since all RCRA hazardous wastes are considered CERCLA hazardous wastes, a RCRA rulemaking designating PFAS as hazardous would eliminate the need for a CERCLA rulemaking.

In addition to bringing PFAS wastes into RCRA's hazardous waste inventory, EPA should look closely at existing hazardous wastes to see if some contain PFAS compounds. The current treatment of those PFAS constituents under EPA's land disposal restrictions program may not be effective, as EPA has recognized in its recent interim PFAS destruction/disposal guidance. One example of this may be some granular GAC wastes that meet RCRA's definition of hazardous waste and also contain PFAS compounds. The carbon regeneration process or the process of treating and then disposing of GAC may result in unintended releases of PFAS to the land, air, surface water, or groundwater.

Finally, EPA should look at the waste management system comprehensively to ensure that as part of waste management, PFAS are not being passed from one media to the next but are being permanently destroyed. In addition to looking at its Subtitle C program, EPA should examine the application of its federal Subtitle D authorities broadly. One possible action would be to add PFAS compounds to the federal municipal solid waste landfill (MSWL) regulations at 40 CFR 258, Appendix I. This list of compounds is part of the detection monitoring program required for groundwater at MSWLs. Given the data that have shown the prevalence of PFAS compounds in MSWL leachate, this would be a prudent and useful update of those regulations. EPA should also investigate PFAS levels in leachate at construction and development landfills to determine if they pose a threat to wastewater treatment plants.

EPA's draft Interim PFAS Destruction and Disposal Guidance documented the serious risks that are posed by every one of the destruction/disposal approaches currently available but did not recommend what should be done given these risks. EPA should revise this guidance to recommend the safe storage of all PFAS materials that are amenable to storage as an interim approach until safe destruction/disposal methods can be identified. Once rulemaking is complete to designate PFAS wastes as hazardous under RCRA, the storage of these wastes will be subject to RCRA hazardous waste requirements.

Until that rulemaking is complete, EPA should recommend the use of RCRA's hazardous waste safe storage practices for PFAS wastes. EPA should recommend that unused aqueous film forming foam (AFFF) be safely collected and warehoused, pursuant to standards that protect against inadvertent use or release. In addition to issuing this guidance, EPA should publicly discourage the landfilling, incinerating, deep well injection, or export of PFAS wastes until the pending analyses of alternate treatment and disposal methods have been completed, and publicly discourage the interim storage of PFAS wastes in environmental justice communities. EPA will need to work closely with the DoD since most AFFF is owned by DoD. EPA should also accelerate the study of safe destruction/disposal approaches by building on the Strategic Environmental Research and Development Program's work on PFAS and by focusing on innovative practices currently under development (e.g., 374Water Clean Solution's Supercritical Water Oxidation technology, which has been shown to effectively destroy PFAS chemicals).

Remediation: Despite the need to use the federal cleanup program to remediate sites with PFAS contamination, CERCLA authorities do not now apply to these sites because no PFAS are listed as CERCLA hazardous substances. The Trump EPA issued an ANPR on possibly designating PFOS and PFOA as hazardous substances under CERCLA; EPA must now move quickly to finalize these designations. EPA must then address the application of CERCLA to other PFAS chemicals. To ensure that responsible parties pay to clean up PFAS contamination of the air, water, and land, EPA should designate groups of PFAS chemicals as hazardous under CERCLA. PFAS chemicals could be grouped by industry sector or by structural/functional similarities for this hazardous substance designation. The first step should be to propose designation of all the long-chain PFAS chemicals as hazardous substances under CERCLA. EPA should also revise the PFAS groundwater cleanup guidance to include GenX and PFBS and to include an emergency removal value for all chemicals covered by the guidance.

Filling Important Gaps in Scientific Understanding

As noted above, numerous gaps in knowledge are impeding effective regulation of PFAS and preventing impacted communities and health professionals from understanding the health and environmental effects of historical and ongoing PFAS exposure. It is imperative that the new PFAS Action Plan include a comprehensive strategy for developing the necessary scientific tools and technologies for developing and implementing regulations. These include validated analytical methods for detecting and measuring many more PFAS in the environment as well as treatment technologies and destruction/disposal methods required to limit environmental releases and address widespread contamination of surface water, drinking water, groundwater, and soil. In addition, there is a pressing need for data to understand the physical-chemical properties of more PFAS, their fate and transport in the environment, their effects on aquatic organisms and wildlife, and the human health effects of individual PFAS and mixtures to which large populations are exposed through products and environmental contamination. Current EPA research efforts under the existing Plan are seriously deficient in meeting these needs.

Support for scaling up research, testing, and technology development requires a mix of enhanced federal funding and stepped-up investment by industry. A currently unutilized tool is Section 4 of TSCA, under which EPA can issue testing orders or rules directing manufacturers to develop analytical methods for both individual chemicals and mixtures as part of their responsibility to monitor for PFAS in waste streams, waterbodies, and biota. TSCA Section 4 orders can also be used to require industry to conduct the animal

and human testing needed to assess the toxicity of PFAS chemicals and mixtures and understand the health effects of prolonged past and continuing exposure by "at risk" communities.

A template for using TSCA Section 4 authorities for these purposes is embodied in the October 2020 TSCA Section 21 petition filed in North Carolina to require Chemours to conduct comprehensive health and environmental effects PFAS testing. The Trump administration's January 7, 2021, denial of the petition was unjustified and should be reversed by the Biden EPA, as recently requested by the petitioners. The agency should then extend the approach in the petition to other PFAS with widespread exposure attributable to particular products or manufacturing operations. In designing testing orders, EPA should recognize the importance of animal testing for human health assessment and revisit the previous administration's directive to "reduce its requests for, and our funding of, mammal studies by 30 percent by 2025 and eliminate all mammal study requests and funding by 2035." *In vitro* and high-throughput assays may provide useful insights and assist in prioritization but are not currently a reliable tool for determining PFAS-identified health effects.

Beyond TSCA testing orders, EPA should investigate ways for EPA to obtain industry funding commitments for research, testing, and technology development. One promising approach would be to use an organization like the independent non-profit Health Effects Institute to conduct research and testing supported by joint EPA and industry funding, a model that has been used successfully for air pollution research.

Broaden Cross-Agency Collaboration

The new PFAS Action Plan should also establish an agency-wide PFAS Task Force to perform the following functions: 1) oversee implementation of the new Plan; 2) track global efforts that address PFAS chemicals; 3) coordinate with other federal agencies addressing PFAS contamination; 4) communicate publicly the prevalence and risks of PFAS chemicals in the U.S.; 5) seek guidance from EPA's National Environmental Justice Advisory Committee (NEJAC), EPA's Children's Health Protection Advisory Committee (CHPAC), and the White House Environmental Justice Advisory Council (WHEJAC); and 6) provide technical assistance to communities with PFAS contamination. Efforts to coordinate with other federal agencies like CDC and NIEHS with overlapping programs are also essential.