

“FOREVER CHEMICALS” ARE IN OUR BODIES, DRINKING WATER, AND THE ENVIRONMENT: NOW IS THE TIME TO HOLD POLLUTERS ACCOUNTABLE AND RAMP UP REGULATION IN THE UNITED STATES

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Since per- and polyfluoroalkyl substances (“PFAS”) were created in the mid-twentieth century, they have made their way into all aspects of the environment, including drinking water sources. Humans, and all living creatures, are repeatedly exposed to these chemicals just by going about their daily lives. Even if a person were able to cut out all consumer products containing PFAS, that person would continue to be exposed through food, water, soil, and other pathways. Science has demonstrated links between PFAS exposure and several diseases; studies continue to uncover precisely how those associations occur. The U.S. Environmental Protection Agency (“EPA”) has known about this class of chemicals and their detrimental effects on human health for decades, yet PFAS remain largely unregulated on the federal level. In the absence of federal drinking water standards, the states are picking up the burdens of setting enforceable limits and cleanup costs. Citizens and states alike are filing lawsuits against PFAS manufacturers to obtain the monetary help they need to begin to address this crisis. It is time for the federal government to fully engage in cooperative federalism and help the states by taking concrete actions under federal statutes to regulate PFAS and hold manufacturers accountable.

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INTRODUCTION

Per- and polyfluoroalkyl substances (“PFAS”) are a class of synthetic chemicals and ubiquitous environmental contaminants. PFAS pollution of drinking water is currently unregulated on the federal level in the United States.¹ Human exposure to PFAS occurs primarily through ingesting contaminated food and water, inhaling household dust, and using products containing PFAS.² In the human body, PFAS chemically bind to blood proteins³ and bioaccumulate,⁴ which has prompted

1. *See infra* Section I.C. This Note will focus on contaminated drinking water because the EPA’s PFAS Action Plan specifically identifies that methods of detection in other contaminated sources are not sufficiently developed. However, it is possible to make meaningful arguments about regulatory or remedial approaches. Although PFAS have contaminated the environment globally, this Note will only focus on contamination and solutions specific to the United States.

2. *How Can I Be Exposed to PFAS?*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/pfas-exposure.html> (last updated June 24, 2020). Examples of products containing PFAS include nonstick cookware, carpet, personal care products, cosmetics, water-resistant clothing, pizza boxes, paper food wrappers, and microwave popcorn bags. *Id.*

3. AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS: DRAFT FOR PUBLIC COMMENT 450 (2018), <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf> [hereinafter TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS]. How long a particular PFAS chemical remains in the human body varies widely. *Id.* at 473–74 tbls.3, 4 & 5 (summarizing elimination half-lives of nine chemicals in humans by biological sex and age).

4. Bioaccumulative substances, like PFAS, build up in concentration inside the body with each additional exposure. *See Bioaccumulation*, MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (11th ed. 2003).

scientists to conduct studies to determine the health effects of PFAS.⁵ It is estimated that 99% of Americans have at least one PFAS chemical bound to their blood. When PFAS enter the environment, they do not degrade.⁶ This means that we will continue to be exposed to PFAS for the foreseeable future, barring any major technological advancements that effectively remove these chemicals from the environment in large quantities. Documented health effects of PFAS exposure include a variety of hormonal effects, changes in metabolism, reduced fetal growth, weakened immune system response, and cancer.⁷

In February 2019, the EPA released its PFAS Action Plan. Within the Action Plan, the EPA included cooperative federalism as one component of its solution.⁸ The EPA described its role as providing technical assistance to state and local public health agencies in their efforts to protect their communities' health.⁹ While the EPA says it needs to wait for more science to support the creation of a federal drinking water standard, some states have already begun to independently regulate PFAS levels in drinking water.¹⁰ A uniform national standard that leaves room for state and local governments to be more protective is needed because drinking water sources across the country are already contaminated and flow across state lines. A patchwork of state-level regulations results when the states are tasked with setting the regulatory floor, which is less effective at addressing widespread PFAS contamination than a federal standard would be.

Part I of this Note discusses background information on PFAS and how humans are exposed to them, describes the findings of several studies on the effects of PFAS exposure on human health, identifies deficiencies in the EPA's PFAS Action Plan, and examines how states and litigators are addressing the problem. Part II provides an overview of the various environmental statutes that provide

5. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, NAT'L INST. OF ENVTL. HEALTH SCIS., <https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm> (last updated Oct. 14, 2020); *see infra* Section I.B.

6. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, *supra* note 5.

7. *See Per- and Polyfluorinated Substances (PFAS) Factsheet*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html (last visited Oct. 11, 2020); *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, *supra* note 5; Rebecca Hersher, *Scientists Dig into Hard Questions About the Fluorinated Pollutants Known as PFAS*, NPR (Apr. 22, 2019), <https://www.npr.org/sections/healthshots/2019/04/22/708863848/scientists-dig-into-hard-questions-about-the-fluorinated-pollutants-known-as-pfa>.

8. U.S. ENVTL. PROT. AGENCY, EPA'S PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) ACTION PLAN 36 (2019) [hereinafter PFAS ACTION PLAN], https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf.

The EPA issued a program update in February 2020. While it is encouraging that the EPA has made some progress toward its goals, the content of the program update does not alter the recommendations contained in this Note. *See* U.S. ENVTL. PROT. AGENCY, EPA PFAS ACTION PLAN: PROGRAM UPDATE (2020), https://www.epa.gov/sites/production/files/2020-01/documents/pfas_action_plan_feb2020.pdf.

9. *See* PFAS ACTION PLAN, *supra* note 8, at 36.

10. *See Per- and Polyfluoroalkyl Substances (PFAS)*, ASS'N OF STATE DRINKING WATER ADM'RS, <https://www.asdwa.org/pfas/> (last visited Jan. 11, 2021).

mechanisms for addressing this crisis as well as the potential use of constitutional principles to seek redress for the vast harm caused to the American people. Part III addresses the need for concrete steps from the federal government to increase regulation of PFAS and provide aid to communities, particularly marginalized communities that suffer from a disparate impact. This Note briefly concludes with a summary of the steps that should be taken to adequately protect public health: (1) using the Toxic Substances Control Act to regulate the production of new PFAS and prevent further introduction of these chemicals into the environment and living beings' bodies; (2) developing a drinking water standard for all PFAS under the Safe Drinking Water Standards Act to ensure drinking water becomes cleaner; (3) using citizens suits and the Comprehensive Environmental Response, Compensation, and Liability Act to ensure affected individuals' harms and communities' cleanup costs associated with newly-set drinking water standards can be properly compensated; and (4) amending existing federal environmental statutes or enacting new federal legislation as needed to build a comprehensive response that goes beyond the EPA's PFAS Action Plan.

I. PER- AND POLYFLUOROALKYL SUBSTANCES, ALSO KNOWN AS “FOREVER CHEMICALS”

A. *What Are These Chemicals and How Are Humans Exposed?*

PFAS are a class of thousands of synthetic chemicals that were accidentally created in the mid-1900s and were initially used for the Manhattan Project and other military purposes.¹¹ PFAS possess chemical properties that make them useful for heat-, oil-, water-, stain-, and grease-resistant coatings and products.¹² PFAS are commonly found in a wide variety of products including clothing, furniture, nonstick cookware, food packaging, firefighting foams, and electrical wire insulation.¹³ Perfluorooctanoic acid (“PFOA”) and perfluorooctanesulfonic acid (“PFOS”), the two most well-studied chemicals in this class, were found in 97% of blood serum samples in a national survey that used a representative sample of the U.S. population.¹⁴

These chemicals linger in the environment and the human body for long periods of time because they contain covalent bonds between carbon and fluorine atoms—one of the strongest chemical bonds.¹⁵ This durability has earned PFAS the nickname “forever chemicals.”¹⁶ One study's estimates of the half-lives of PFOA, PFOS, and perfluorohexanesulfonic acid (“PFHxS”) in the human body ranged

11. See ROBERT BILOTT, *EXPOSURE: POISONED WATER, CORPORATE GREED, AND ONE LAWYER'S TWENTY-YEAR BATTLE AGAINST DUPONT* 56–58 (2019).

12. E.g., *Per- and Polyfluorinated Substances (PFAS) Factsheet*, *supra* note 7.

13. E.g., Hersher, *supra* note 7; *id.*

14. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, *supra* note 5 (referring to the National Health and Nutrition Examination Survey (“NHANES”)).

15. *Id.*

16. Hersher, *supra* note 7.

between 3.8 and 8.5 years;¹⁷ these half-lives are a measure of how long it would take for half of the amount of that particular chemical to leave the body. According to David Ross, the EPA's assistant administrator for the Office of Water, "Despite their everyday use, the body of science necessary to fully understand and regulate these chemicals is not yet as robust as it needs to be."¹⁸

The Agency for Toxic Substances and Disease Registry ("ATSDR") is tasked with determining whether exposures to contaminants are a threat to human health, but it lacks regulatory authority.¹⁹ The ATSDR has developed Minimal Risk Levels²⁰ for drinking water exposure to PFOA, PFOS, PFHxS, and perfluorononanoic acid ("PFNA") based on epidemiologic and toxicologic data.²¹ Minimal Risk Levels are not intended for use as enforceable drinking water standards but provide a level of exposure below which health effects are not expected.²² As of 2018, the Minimal Risk Levels measured in parts per trillion ("ppt") for adults and children, respectively, were: 78 and 21 ppt for PFOA; 52 and 14 for PFOS; 517 and 140 for PFHxS; and 78 and 21 for PFNA.²³ A level of uncertainty still exists with these values, as further research on PFAS exposure and toxicity is required to refine them.²⁴ Identification of PFAS-contaminated drinking water sources is still ongoing. As of January 2021, the Environmental Working Group reported 2,337 contaminated sites across 49 states, including military sites, drinking water sources, and other sites.²⁵

Military sites are a major source of PFAS contamination because PFAS give aqueous film-forming foams ("AFFF") heat-resistant qualities and the capability to form a film on petroleum surfaces.²⁶ The Department of Defense

17. Ryan C. Lewis et al., *Serum Biomarkers of Exposure to Perfluoroalkyl Substances in Relation to Serum Testosterone and Measures of Thyroid Function Among Adults and Adolescents from NHANES 2011–2012*, 12 INT'L J. ENVTL. RES. & PUB. HEALTH 6098, 6099 (2015).

18. Hersher, *supra* note 7. Section I.B., *infra*, questions that statement.

19. *ATSDR's Minimal Risk Levels (MRLs) and Environmental Media Evaluation Guides (EMEGs) for PFAS*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY [hereinafter *Minimal Risk Levels and Evaluation Guides*], https://www.atsdr.cdc.gov/pfas/mrl_pfas.html (last updated June 24, 2020).

20. CERCLA requires the ATSDR to set Minimal Risk Levels ("MRLs"). For more information about the process that ATSDR goes through to set MRLs, see *Minimal Risk Levels (MRLs)*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/minimalrisklevels/> (last updated June 4, 2018).

21. *Minimal Risk Levels and Evaluation Guides*, *supra* note 19.

22. *Id.*

23. *Id.*

24. *See generally id.*; PFAS ACTION PLAN, *supra* note 8, at 34.

25. *Mapping the PFAS Contamination Crisis: New Data Show 2,337 Sites in 49 States*, ENVTL. WORKING GRP. [hereinafter *EWG National Map*], https://www.ewg.org/interactive-maps/pfas_contamination/ (last visited Feb. 22, 2021). As of the January 2021 update of this map, drinking water source contamination is particularly widespread in California, Colorado, Massachusetts, Michigan, New Hampshire, New Jersey, North Carolina, Ohio, and Rhode Island. *See id.*

26. Melanie Benesh, *Mapping PFAS Chemical Contamination at 206 U.S. Military Sites*, ENVTL. WORKING GRP., <https://www.ewg.org/research/pfas-chemicals-contaminate-us-military-sites> (last updated July 19, 2019).

(“DOD”) conducted studies in 1983 after learning that AFFFs used for firefighting, which contain PFOA and PFOS, were releasing chemicals into the surface and groundwater near military sites.²⁷ A DOD employee circulated a memo in 2001 to the DOD, EPA, and other federal agencies stating that “EPA data indicated ‘PFOS chemicals are persistent, bioaccumulating, and toxic.’ . . . ‘PFOA . . . [is also persistent] in the environment and more toxic than PFOS.’”²⁸ Even though the DOD had the results of its own 1983 studies, knew of the toxic effects by 2001, and possibly had this knowledge even earlier, it was not until 2014 that the DOD began to test water supplies for these chemicals.²⁹ The Environmental Working Group’s map published in December 2019 identified 305 U.S. military sites where groundwater and drinking water were contaminated with PFAS.³⁰ Groundwater is known or suspected to be contaminated at about a hundred more sites.³¹ At least 90 sampled sites on the Environmental Working Group’s map exceeded the EPA’s 70 ppt health advisory guideline.³²

Use of AFFF was mandatory until the military began to phase out these foams in 2015,³³ though the foams will continue to be used at military sites until the phase-out is completed in 2024.³⁴ The ATSDR and Centers for Disease Control and Prevention (“CDC”) will conduct exposure assessments in communities near military bases where PFAS are known to be in the drinking water to determine the extent and possible sources of exposure.³⁵ These sites were chosen based on estimates of the number of people exposed, the magnitude of exposure, and the duration of community exposure.³⁶ Pilot studies are already underway in Bucks and Montgomery Counties in Pennsylvania and in Westhampton, New York.³⁷

27. Kyle Bagenstose, *Records: Military Knew of Foam Dangers in 2001*, BUCKS CTY. COURIER TIMES (July 15, 2017), <https://www.buckscountycouriertimes.com/article/20170715/news/307159936>.

28. *Id.*

29. *Id.*

30. Press Release, Env’tl. Working Grp., *New EWG Map: 305 Military Sites That Used PFAS-based Firefighting Foam* (Dec. 10, 2019), <https://www.ewg.org/release/new-ewg-map-305-military-sites-used-pfas-based-firefighting-foam>.

31. *See* Benesh, *supra* note 26.

32. *Id.*

33. *Id.*

34. Melanie Benesh, *It’s Time to Switch to PFAS-Free Firefighting Foams*, ENVTL. WORKING GRP. (Apr. 22, 2020), <https://www.ewg.org/news-and-analysis/2020/04/its-time-switch-pfas-free-firefighting-foams>.

35. *PFAS Exposure Assessments*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/PFAS-Exposure-Assessments.html> (last updated June 30, 2019). The sites chosen for testing are located in Fairbanks North Star Borough, Alaska; Spokane County, Washington; El Paso County, Colorado; Lubbock County, Texas; Berkeley County, West Virginia; New Castle County, Delaware; Westhampton, New York; Orange County, New York; Bucks County, Pennsylvania; Montgomery County, Pennsylvania; and Hampden County, Massachusetts. *Site Locations*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/site-locations.html> (last updated July 23, 2020).

36. *Frequently Asked Questions*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/FAQ.html> (last updated June 24, 2020).

37. *PFAS Exposure Assessments*, *supra* note 35.

The chemical properties of PFAS also make them difficult to remove from contaminated drinking water. Traditional physical and chemical methods of treating water are inefficient at removing PFAS.³⁸ A study of 25 drinking water treatment plants across the United States found that plants using Granular Activated Carbon (“GAC”), which “comes at a high but reasonable cost,” achieved significant removal of PFAS from drinking water.³⁹ Treatment plants that recharged their GAC treatment beds more frequently than a utility normally would recharge for taste and odor control had the most significant results.⁴⁰ Research on treatment methods has also revealed that ozonation, the use of ozone to disinfect water,⁴¹ actually increases the concentration of certain PFAS in water.⁴² Other methods such as nanofiltration or reverse osmosis can also be effective, but these methods produce a highly concentrated waste product which must be safely disposed of in a way that does not recontaminate the environment.⁴³

B. A Brief Overview of Scientific Research on the Effects of PFAS Exposure on Human Health

The Toxicological Profile for Perfluoroalkyls produced by the ATSDR contains over 400 pages of information about the health effects of PFAS exposure.⁴⁴ This Note cannot even begin to cover all of the Profile’s findings or the thousands of studies that have been conducted to understand the health effects of PFAS exposure. However, some statutes discussed in Part II of this Note⁴⁵ require documented effects of chemicals on human health before regulation can occur, so the findings of a handful of relevant studies are covered here. Although further study is required, research has already been conducted to determine what effects PFAS exposure may have on human health.⁴⁶ Some studies show that PFAS exposure may “affect growth, learning, and behavior of infants and older children; lower a woman’s chance of getting pregnant; interfere with the body’s natural hormones; increase cholesterol levels; affect the immune system; and increase the risk of cancer.”⁴⁷

38. Xavier Dauchy, *Per- and Polyfluoroalkyl Substances (PFASs) in Drinking Water: Current State of the Science*, 7 CURRENT OPINION ENVTL. SCI. & HEALTH 8, 9 (2019).

39. J. Scott Boone et al., *Per- and Polyfluoroalkyl Substances in Source and Treated Drinking Waters of the United States*, 653 SCI. TOTAL ENV’T 359, 365 (2019).

40. *Id.*

41. See generally Feilicien Mazille & Dorothee Spuhler, *Ozonation*, SUSTAINABLE SANITATION & WATER MGMT. TOOLBOX, <https://sswm.info/sswm-university-course/module-6-disaster-situations-planning-and-preparedness/further-resources-0/ozonation> (last visited Apr. 24, 2020).

42. Dauchy, *supra* note 38, at 10.

43. *Id.* at 9–10.

44. TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS, *supra* note 3, at 21–449.

45. See *infra* Sections II.A–B.

46. See *What Are the Health Effects?*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/health-effects.html> (last updated June 24, 2020).

47. Press Release, Agency for Toxic Substances & Disease Registry, CDC/ATSDR Invites the Public to Learn About PFAS Exposure Assessment in Hampden County, Mass. (July 2, 2019), <https://www.atsdr.cdc.gov/news/displaynews.asp?PRid=2672>.

One study used data on testosterone, several thyroid hormones, and blood serum PFAS collected during the 2011–2012 National Health and Nutrition Examination Survey to determine whether PFAS exposure was associated with disruption in hormone levels.⁴⁸ The study did not find a statistically significant association between testosterone levels and PFAS, which was consistent with findings from global studies.⁴⁹ However, it did find statistically significant sex-based differences for thyroid stimulating hormone (“TSH”) levels,⁵⁰ which regulates the production of thyroid hormones.⁵¹ Exposed adolescent males had increased levels of TSH, while exposed adolescent females had decreased levels of TSH.⁵² That difference could not be definitively attributed to any cause, but researchers posited that differences induced by PFAS during this period of growth and development could have effects on growth and reproduction.⁵³

Inhalation exposure and blood-bound PFAS can have an effect on the lungs.⁵⁴ Asthma, fibrosis, COPD, and other lung diseases are thought to be associated with inhalation exposure to PFAS.⁵⁵ In a study where human bronchial epithelial cell cultures were exposed in vitro to varying concentrations of PFAS chemicals simulating real-world variance in exposure, lung surfactant function—which is critical to maintaining proper lung function and surface tension—was inhibited for cells exposed to PFHxS, PFOS, and PFOA.⁵⁶

C. The U.S. EPA’s PFAS Action Plan

The EPA released its PFAS Action Plan in February 2019, setting forth short-term and long-term actions in response to concern about the potential health effects of environmental exposure to PFAS.⁵⁷ These efforts focus on partnerships with other federal agencies, as well as state, tribal, and local governments to: (1) prevent further pollution; (2) adequately assess the risks PFAS pose to humans and the environment; (3) develop effective treatment technologies; (4) educate the public through risk communication; and (5) promulgate and enforce standards.⁵⁸ The sheer number of PFAS presents a challenge for research and regulation because it is difficult to obtain a complete picture of the effects on human health when there are multiple exposures.⁵⁹ Furthermore, reliable technology and methods for measuring

48. Lewis et al., *supra* note 17, at 6099–101.

49. *Id.* at 6107.

50. *Id.* at 6107–08.

51. Yasaman Pirahanchi & Ishwarlal Jialal, *Physiology, Thyroid Stimulating Hormone (TSH)*, STATPEARLS, <https://www.ncbi.nlm.nih.gov/books/NBK499850/> (last updated June 28, 2020).

52. Lewis et al., *supra* note 17, at 6105–06.

53. *Id.* at 6108.

54. J.B. Sørli, et al., *Per- and Polyfluoroalkyl Substances (PFASs) Modify Lung Surfactant Function and Pro-Inflammatory Responses in Human Bronchial Epithelial Cells*, 62 TOXICOLOGY IN VITRO 1, 1 (2020).

55. *Id.* at 7.

56. *Id.* at 2–3, 5, 7.

57. PFAS ACTION PLAN, *supra* note 8, at 8.

58. *Id.*

59. *See id.* at 10, 13.

PFAS exposure via the air, soil, and nondrinking water ingestion pathways are needed to fully assess the risk to human health that PFAS present.⁶⁰

The Action Plan includes a summary of how the EPA has already started to use its authority under the Toxic Substances Control Act (“TSCA”), Safe Drinking Water Act (“SDWA”), and Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) to address PFAS.⁶¹ For example, Significant New Use Rules (“SNURs”) exist for certain PFAS that require manufacturers and processors to notify the EPA before the chemical is put to a significant new use.⁶² As manufacturers have willingly transitioned away from longer-chained PFAS, like PFOA and PFOS, to short-chain PFAS, SNURs have given the EPA advance opportunity to evaluate potential health effects of the short-chain replacements.⁶³ Additionally, PFOA and PFOS were placed on the Contaminant Candidate List in 2016 to begin the process of regulating them under SDWA,⁶⁴ and nonenforceable lifetime health advisories of 70 ppt were issued.⁶⁵ Finally, the EPA has begun the process to designate PFOA and PFOS as hazardous substances under CERCLA.⁶⁶

As discussed in the previous section, there is a growing body of research about the human health and ecological effects of PFAS exposure, which the EPA identifies as research focus area number one in the Action Plan.⁶⁷ To assist human health risk assessment studies, the EPA is supporting and conducting research to develop human health toxicity values using traditional toxicity assessment studies and computer modeling for as many categories of PFAS as possible.⁶⁸ When more information about the health effects of exposure to multiple PFAS is available, the EPA can then determine human health toxicity values and will be in a better position to create enforceable standards under the SDWA.⁶⁹ Understanding the various routes of exposure by developing the technology to detect and measure a variety of PFAS in air, soil, and water is key to human health risk assessment studies.⁷⁰ Finally, EPA efforts to support research that more efficiently and effectively removes PFAS from drinking water will help fill information gaps necessary to develop maximum contaminant levels under the SDWA.⁷¹

60. *Id.* at 34.

61. *Id.* at 13–15.

62. *Id.* at 13–14. For more information about SNURs, see *infra* Section II.B.

63. See PFAS ACTION PLAN, *supra* note 8, at 13–14.

64. *Id.*; see *Contaminant Candidate List (CCL) and Regulatory Determination*, U.S. ENVTL. PROT. AGENCY [hereinafter *CCL and Regulatory Determination*], <https://www.epa.gov/ccl/chemical-contaminants-ccl-4> (last visited Apr. 24, 2020).

65. PFAS ACTION PLAN, *supra* note 8, at 14, 20.

66. *Id.* at 15.

67. *Id.* at 32.

68. *Id.* at 32–33. For more information about human health risk assessment, as the EPA plans to conduct these assessments, see *id.* at 26–27.

69. *Id.* at 33; see 42 U.S.C. § 300g-1(b)(1)(A) (requiring a determination of the human health effects to issue a primary drinking water regulation).

70. PFAS ACTION PLAN, *supra* note 8, at 34.

71. See *id.* at 35; 42 U.S.C. § 300g-1(b)(1)(A) (listing determinations that must be made to establish a maximum contaminant level).

PFAS are found in drinking water sources throughout the country.⁷² Risk communication is critical to supporting efforts in local communities and accurately educating the public about health risks.⁷³ Stakeholders have expressed a desire to receive consistent information across the levels of government partnering to address the issue.⁷⁴ Under the Action Plan, a risk communication toolbox, which included materials such as fact sheets, infographics, sample language and materials which address key questions from the public, was supposed to be developed and completed in 2019.⁷⁵ As of this writing, the website that was supposed to contain “the complete set of tools,” according to the Action Plan, only contains copies of EPA press releases from 2017 to 2019.⁷⁶ However, the PFAS Risk Communication Hubs that the Environmental Research Institute of the States⁷⁷ and the Association of State and Territorial Health Officials⁷⁸ created contain more comprehensive resources.⁷⁹ At the PFAS National Leadership Summit held in May 2018, stakeholders indicated a preference for “developing and relying on the best available science even if that means not rushing to implement regulatory actions in the near term.”⁸⁰

Prior to the EPA’s release of the PFAS Action Plan, policy analysts at the Environmental Working Group suggested several ways the EPA should address the crisis.⁸¹ Strategies include: setting legally enforceable limits for tap water on the federal and state levels; requiring the military to clean up spills; requiring polluters to contribute to cleanup costs; designating PFAS as a hazardous substance regulable under CERCLA; halting approval on new PFAS chemicals; requiring release disclosures; and requiring monitoring to develop a full picture of where exposure has already occurred.⁸²

72. *EWG National Map*, *supra* note 25.

73. PFAS ACTION PLAN, *supra* note 8, at 37.

74. *See id.*

75. *Id.* at 38–39.

76. *Id.* at 39; *PFAS Communication and Outreach Tools*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/pfas/pfas-communication-and-outreach-tools> (last visited Jan. 12, 2021).

77. *See generally PFAS Risk Communications Hub*, ENVTL. RES. INST. OF THE STATES, <https://www.eristates.org/projects/pfas-risk-communications-hub/> (last visited Nov. 23, 2020).

78. *PFAS Risk Communications Hub*, ASS’N OF STATE & TERRITORIAL HEALTH OFFICIALS, <https://www.astho.org/PFAS/> (last visited Nov. 23, 2020).

79. According to the EPA, the development of these Risk Communication Hubs was done as part of one of its collaborative projects, but the extent of the EPA’s involvement is unknown. *Collaborative Projects with State Environmental Health Experts*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/research-states/collaborative-projects-state-environmental-health-experts> (last visited Jan. 12, 2021).

80. PFAS ACTION PLAN, *supra* note 8, at 39–40.

81. Melanie Benesh & Scott Faber, *How the EPA Should Act to Protect Americans from Toxic PFAS Chemicals*, ENVTL. WORKING GRP. (Feb. 6, 2019), <https://www.ewg.org/news-and-analysis/2019/02/how-epa-should-act-protect-americans-toxic-pfas-chemicals>.

82. *Id.*

D. States Are Already Taking Action to Protect Their Citizens

In the absence of federal regulation, the states have taken the lead on regulating PFAS. By October 2018, eight states had set enforceable drinking water standards or were in the process of doing so, and 11 other states were considering similar actions.⁸³ Some states had set enforceable standards for concentrations of certain PFAS or adopted health advisories that were equivalent to or more protective than the EPA's health advisory of 70 ppt.⁸⁴ For example, California's notification levels for PFOA and PFOS are set at 5.1 and 6.5 ppt, respectively.⁸⁵ New Hampshire has adopted enforceable limits of 12 ppt for PFOA, 15 ppt for PFOS, 18 ppt for PFHxS, and 11 ppt for PFNA, and it requires water systems, landfills, and wastewater plants to conduct regular tests for these four chemicals.⁸⁶ However, 3M successfully obtained an injunction in New Hampshire state court that took effect December 31, 2019, and suspended the state's enforcement of these new rules.⁸⁷

Massachusetts is financially supporting its towns and cities in their efforts to address PFAS contamination in public water supplies.⁸⁸ Under this new program, cities and towns may apply to receive interest-free loans; the state has allocated \$10,650,000 from a budget surplus to finance this program.⁸⁹ Furthermore, the state has worked with fire departments to prevent additional contamination to public water systems from aqueous firefighting foams.⁹⁰ At no cost to the fire departments, the Massachusetts Department of Environmental Protection is safely disposing the foams in a take-back program.⁹¹ In December 2019, the Massachusetts Department of Environmental Protection submitted a proposal to set a state-wide enforceable

83. Gerald B. Silverman, *Glass Half-Full on State Solutions to Chemicals in Water (Corrected)*, BLOOMBERG L. (Sept. 18, 2018), https://www.bloomberglaw.com/document/XAR2V5MG000000?bna_news_filter=environment-and-energy&jcsearch=BNA%2520000001658114db3ca56f9b75b3710002#jcite.

84. *Id.*

85. *Drinking Water Resources*, CAL. WATER BDS., https://www.waterboards.ca.gov/pfas/drinking_water.html (last updated Dec. 17, 2020).

86. Annie Ropeik, *N.H. Approves Unprecedented Limits for PFAS Chemicals in Drinking Water*, N.H. PUB. RADIO (July 18, 2019), nhpr.org/post/nh-approves-unprecedented-limits-pfas-chemicals-drinking-water#stream/0.

87. Adrienne Appel, *New Hampshire Judge Suspends State's New PFAS Restrictions*, BLOOMBERG L. (Nov. 26, 2019), https://www.bloomberglaw.com/document/X6H26AQS000000?bna_news_filter=environment-and-energy&jcsearch=BNA%25200000016eaa39dbca16ebfbf62930001#jcite. Subsequently, both parties have filed interlocutory appeals. *See generally* Parties' Joint Interlocutory Appeal Statement, Plymouth Vill. Water & Sewer Dist. v. Scott, No. 217-2019-CV-00650 (N.H. Super. Ct. Jan. 24, 2020), <https://www.courts.state.nh.us/caseinfo/pdf/civil/Plymouth/012420Plymouth-stmt.pdf>.

88. Michael Norton, *State Loan Program to Address PFAS in Water Supplies*, CAPE COD TIMES (Feb. 4, 2020), <https://www.capecodtimes.com/news/20200204/state-loan-program-to-address-pfas-in-water-supplies>.

89. *Id.*

90. *Id.*

91. Press Release, Mass. Dep't of Env'tl. Prot., *Statewide Program Eradicates Nearly 150,000 Pounds of Toxic Firefighting Foam to Ensure Public Health* (Feb. 25, 2019), <https://www.mass.gov/news/statewide-program-eradicates-nearly-150000-pounds-of-toxic-firefighting-foam-to-ensure-public>.

standard of 20 ppt for six PFAS.⁹² The final state Maximum Containment Levels (“MCLs”) of 20 ppt was published on October 2, 2020.⁹³

Similarly, Wisconsin legislators introduced a bill with short-term and long-term approaches to address the PFAS contamination crisis.⁹⁴ This appropriations bill would have allocated \$7,700,000 over two years to provide grants to local governments for contamination cleanup, testing wildlife and drinking water systems, and research.⁹⁵ The Wisconsin Department of Natural Resources was already ordered to create enforceable standards for PFAS in groundwater and source water, but this bill would have required the creation of emergency rules that could be promulgated more quickly.⁹⁶ The bill also provided for health monitoring at the polluters’ expense, and the creation of a trust fund to collect damages the state obtains through successful litigation over PFAS.⁹⁷ Although this bill died when the legislature was adjourned,⁹⁸ future bills with bipartisan support could be passed in the state.

E. Past and Ongoing PFAS Litigation

Litigation concerning PFAS primarily involves claims against the chemical manufacturers. For example, the film *Dark Waters* is based on the litigation and settlement over DuPont’s contamination of rivers in West Virginia by dumping PFAS into the water.⁹⁹ The C8 Science Panel was created as part of that settlement to monitor affected residents for various health conditions.¹⁰⁰ The C8 Science Panel collected samples from August 2005 until July 2006,¹⁰¹ and its findings were published in late 2011 through the fall of 2012.¹⁰² The panel’s ultimate findings

92. Ethan Genter, *State Proposes New Limits on Toxic PFAS Chemicals*, CAPE COD TIMES (Dec. 13, 2019), <https://www.capecodtimes.com/news/20191213/state-proposes-new-limits-on-toxic-pfas-chemicals>.

93. *Per- and Polyfluoroalkyl Substances (PFAS)*, MASS.GOV, <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#pfas-and-waste-sites-> (last visited Feb. 1, 2020).

94. See Todd Richmond, *Wisconsin Lawmakers Introduce Sweeping PFAS Pollution Bill*, WBAY (Jan. 31, 2020), <https://www.wbay.com/content/news/Wisconsin-lawmakers-introduce-sweeping-PFAS-pollution-bill-567455831.html>.

95. *Id.*

96. *Id.*

97. *Id.*

98. WIS. STATE LEG., STATE OF WISCONSIN SENATE JOURNAL ONE-HUNDRED AND FOURTH REGULAR SESSION, 104th Sess. (2020), https://docs.legis.wisconsin.gov/2019/related/journals/senate/20200401/_11 (listing S.B. 302 as among the list of bills “in the possession of the Senate at the end of the last general business floorperiod, which was adjourned on March 26, 2020 and therefore adversely disposed of pursuant to Senate Joint Resolution 1”).

99. See generally DARK WATERS (Focus Features 2019); *The Science Panel*, C8 SCI. PANEL, <http://c8sciencepanel.org/panel.html> (last visited Apr. 24, 2020); BILOTT, *supra* note 11.

100. See generally DARK WATERS, *supra* note 99; *The Science Panel*, *supra* note 99.

101. *The Science Panel*, *supra* note 99.

102. See *C8 Probable Link Reports*, C8 SCI. PANEL, c8sciencepanel.org/prob_link.html (last visited Apr. 24, 2020); see also BILOTT, *supra* note 11, at 306–08.

included a probable link between PFOA and high cholesterol, ulcerative colitis, thyroid disease, testicular cancer, kidney cancer, and pregnancy-induced hypertension.¹⁰³

More recently, plaintiffs filed a federal class-action lawsuit in the Eastern District of Ohio against 3M, DuPont, and other manufacturers,¹⁰⁴ alleging that the manufacturers' research in the 1960s showed toxic effects to organ systems in animals and that the chemicals would not degrade in the environment.¹⁰⁵ The complaint further alleges that the manufacturers knew in the 1970s that PFOA and PFOS would bind to human and animal blood proteins and accumulate with each exposure.¹⁰⁶ In addition, plaintiffs allege that manufacturers' studies found further potential negative health effects between 1980 and 2010, yet the manufacturers told the EPA and public health agencies "that such exposures presented no risk of harm and were of no legal, toxicological, or medical significance of any kind."¹⁰⁷ These activities continued even as manufacturers changed to producing short-chain PFAS.¹⁰⁸ The complaint seeks claims for relief under negligence, battery, declaratory judgment, and conspiracy, and prays for injunctive relief and the establishment of a panel of scientists that would perform similar functions as the C8 Science Panel.¹⁰⁹

On September 30, 2019, the court denied the defendants' motion to dismiss.¹¹⁰ It rejected the defendants' argument that "mere presence of an unidentified level of some type of PFAS in his blood . . . does not constitute currently existing or future injury in fact," and found the plaintiff had standing because the defendants' conduct exposed the plaintiff to PFAS and caused an increased risk of disease.¹¹¹ Furthermore, the court found that its broad power to issue equitable remedies includes the ability to grant the request to establish a science panel, which the court has done before with tort claims requiring medical monitoring.¹¹²

States are also beginning to bring actions against PFAS manufacturers. In late 2019, the New York Attorney General's office filed a complaint in state court

103. *C8 Probable Link Reports*, *supra* note 102.

104. First Amended Class Action Complaint & Jury Demand at 1–7, *Hardwick v. 3M Co.*, No. 2:18-cv-1185-EAS-EPD (E.D. Ohio Apr. 16, 2019) [hereinafter *First Amended Complaint*].

105. *Id.* at 8.

106. *Id.* Documents obtained by the Environmental Working Group containing results of 3M and DuPont studies support each of these allegations. *For Decades, Polluters Knew PFAS Chemicals Were Dangerous but Hid Risks from the Public*, ENVTL. WORKING GRP., <https://www.ewg.org/pfastimeline/> (last visited Apr. 24, 2020) [hereinafter *Polluters Knew PFAS Chemicals Were Dangerous*].

107. First Amended Complaint, *supra* note 104, at 9–11; *see also Polluters Knew PFAS Chemicals Were Dangerous*, *supra* note 106.

108. First Amended Complaint, *supra* note 104, at 11–12.

109. *See id.* at 24, 26, 28, 30–31.

110. Opinion & Order Denying Defendant's Motion to Dismiss at 35, *Hardwick v. 3M Co.*, No. 2:18-cv-1185-EAS-EPD (E.D. Ohio Sept. 30, 2019) [hereinafter *Opinion & Order*].

111. *Id.* at 10–16.

112. *Id.* at 17–21.

against 3M, DuPont, and other companies, alleging that the companies' PFAS-based firefighting foam products damaged the state's natural resources.¹¹³ New York also has an ongoing lawsuit against 3M, Tyco Fire Products, National Foam, Buckeye Fire Equipment, Kidde-Fenwal, and Chemguard "seeking at least \$39 million for the cost of cleaning up toxic chemical residues."¹¹⁴ Likewise, New Hampshire is suing 3M, DuPont, and other manufacturers of PFAS alleging that they had spent decades concealing knowledge of the harmful effects of PFAS on human health.¹¹⁵ That lawsuit seeks damages for the costs of investigating and cleaning up New Hampshire's natural resources affected by PFAS contamination and enhanced compensatory damages "on grounds that the companies' actions were malicious and negligent."¹¹⁶

II. LEGAL FRAMEWORK FOR POTENTIAL SOLUTIONS

Part I laid out the components of what contributes to the problem of PFAS contamination: their manufacture, use, continuing presence in the environment, capacity to harm human health, and the costly technology required to remove PFAS from drinking water. Part II of this Note discusses the legal framework that could be used to tackle the component parts of the PFAS problem.

A. *The Safe Drinking Water Act*

The Safe Drinking Water Act ("SDWA")¹¹⁷ was enacted to ensure safe drinking water supplies by regulating public water systems, which are responsible for removing contaminants from drinking water.¹¹⁸ Contaminants regulated by the SDWA include "any physical, chemical, biological, or radiological substance or matter in water."¹¹⁹ Those contaminants may be human-made or naturally occurring.¹²⁰ A public water system is a private or public utility that "has at least fifteen service connections or regularly serves at least twenty-five individuals."¹²¹ Public water systems are divided into three subcategories based on how long and to which population the public water system provides services: Community Water Systems, Non-Transient Non-Community Water Systems, and Transient Non-Community Water Systems. Individual private wells are not regulated by the

113. Keshia Clukey, *N.Y. Sues Chemours, DuPont, 3M Over PFAS Contamination* (2), BLOOMBERG L. (Nov. 5, 2019), <https://news.bloombergenvironment.com/environment-and-energy/n-y-sues-chemours-dupont-3m-over-pfas-contamination>.

114. *Id.*

115. Ropeik, *supra* note 86.

116. Annie Ropeik, *N.H. Sues Makers of PFAS Chemicals for Drinking Water Contamination*, N.H. PUB. RADIO (May 29, 2019), <https://www.nhpr.org/post/nh-sues-makers-pfas-chemicals-drinking-water-contamination#stream/0>.

117. 42 U.S.C. §§ 300f–300j–27.

118. RUSSELLYN S. CARRUTH & BERNARD D. GOLDSTEIN, ENVIRONMENTAL HEALTH LAW AN INTRODUCTION 108–09 (2014).

119. § 300f(6).

120. *Background on Drinking Water Standards in the Safe Drinking Water Act (SDWA)*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/dwstandardsregulations/background-drinking-water-standards-safe-drinking-water-act-sdwa> (last visited Apr. 24, 2020) [hereinafter *Background on Drinking Water Standards in the SDWA*].

121. § 300f(4)(A); *see also* CARRUTH & GOLDSTEIN, *supra* note 118, at 109.

SDWA.¹²² The SDWA provides mechanisms for creating enforceable national drinking water standards as well as nonenforceable contaminant level goals.¹²³ Under the SDWA, the states are given primary enforcement responsibility if they adopt regulations that match federal regulations, but they can impose even more stringent standards.¹²⁴

The EPA Administrator selects contaminants for primary drinking water regulations based on a determination that: (1) the contaminant possibly has an “adverse effect on the health of persons;” (2) there is “a substantial likelihood that the contaminant will occur in public water systems with a frequency at levels of public health concern;” and (3) “regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.”¹²⁵ Maximum contaminant levels are set by evaluating the economic and technological feasibility of attaining a particular level in public water systems as well as the health risk reduction benefits.¹²⁶ Where it is not feasible to attain the MCL, a primary drinking water regulation instead sets forth the treatment techniques that sufficiently reduce the contaminant level.¹²⁷ Primary drinking water regulations must also include quality control methods and compliance testing procedures.¹²⁸ Currently, primary drinking water regulations exist for over 90 contaminants and are reviewed every six years.¹²⁹

Every five years, the EPA must publish the Contaminant Candidate List containing unregulated contaminants that are being considered for regulation.¹³⁰ The regulation process requires consultation with scientists and an opportunity for public notice and comment.¹³¹ The EPA Administrator’s decisions regarding which contaminants to include on the Contaminant Candidate List are not subject to judicial review.¹³² From the Contaminant Candidate List, the Administrator must determine whether to regulate at least five contaminants.¹³³ That determination is “based on the best available public health information” to satisfy the three criteria for primary drinking water regulations discussed above, and the determination *is* subject to judicial review.¹³⁴

The SDWA provides for the regulatory regime that is needed to adequately address PFAS present in public water systems. Although not all drinking water sources are covered under the SDWA’s jurisdiction, setting an MCL for the most

122. *Background on Drinking Water Standards in the SDWA*, *supra* note 120.

123. *See* § 300g-1.

124. § 300g-2(a).

125. § 300g-1(b)(1)(A).

126. §§ 300f(1)(C)(i), 300g-1(b)(3)(C)(i).

127. § 300f(1)(C)(ii).

128. § 300f(1)(D).

129. *How EPA Regulates Drinking Water Contaminants*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/dwregdev/how-epa-regulates-drinking-water-contaminants> (last visited Apr. 24, 2020).

130. § 300g-1(b)(1)(B)(i)(I).

131. *Id.*

132. § 300g-1(b)(1)(B)(i)(III).

133. § 300g-1(B)(1)(B)(ii)(I).

134. § 300g-1(B)(1)(B)(ii)(II), (IV).

commonly found PFAS would be a good starting point. Beyond that, eventually MCLs should be set for all PFAS detected in public water systems when the scientific literature to support standards for those chemicals is sufficiently developed. Setting an MCL applicable nationwide is preferable because the MCL ensures that human health is being protected in an economically and technologically feasible manner. When all regulation is left to the states, there is a risk that some states may do nothing, and others may not set standards that are protective enough of human health. After the MCLs are set, there will be a baseline from which the individual states can choose to protect human health even further. Naturally, the MCLs might need to change over time as more is known about what levels of exposure to PFAS, if any, do not cause harms to health and as technological innovation adjusts the feasibility analyses involved in setting MCLs.

B. The Toxic Substances Control Act

The Toxic Substances Control Act (“TSCA”),¹³⁵ enacted in 1976, provides for EPA evaluation and regulation to protect human health and the environment from unreasonable risks caused by new and existing chemicals.¹³⁶ As the EPA fulfills the goal of preventing unreasonable risk, it must also ensure it does not “impede unduly or create unnecessary economic barriers to technological innovation.”¹³⁷ TSCA regulates the manufacture and sale of chemicals if an unreasonable risk arises from manufacture, distribution in interstate commerce, processing, use, disposal of the chemical, or any combination thereof.¹³⁸ Several factors are considered to determine whether a chemical’s risks outweigh its benefits and therefore whether the chemical presents an unreasonable risk: adverse effects on humans and the environment; magnitude of exposure; various uses and their benefits; availability of substitutes; and economic consequences on business, the environment, and public health.¹³⁹ States may apply for and receive federal grants created by TSCA to establish and operate programs that address risks that the EPA is unable or unlikely to prevent or eliminate.¹⁴⁰

The EPA may also require testing and notice under TSCA.¹⁴¹ For example, SNURs, which require 90 days’ notice before the new use of a chemical begins, can be promulgated if the new use results in significantly increased risk to health and the environment.¹⁴² Similarly, Premanufacture Notices are required 90 days prior to manufacturing or introducing into commerce a new chemical that is not already on the TSCA Inventory.¹⁴³ Premanufacture Notices must include information about the chemical; data on human health and environmental effects; and projected production, use, disposal, and anticipated human exposure and environmental

135. 15 U.S.C. §§ 2601–23, 2625–29, 2641–56, 2661–71, 2681–92, 2695–2695d, 2697 (2018).

136. CARRUTH & GOLDSTEIN, *supra* note 118, at 226.

137. 15 U.S.C. § 2601(b)(3).

138. CARRUTH & GOLDSTEIN, *supra* note 118, at 232.

139. *Id.*

140. 15 U.S.C. § 2627.

141. 15 U.S.C. § 2603.

142. CARRUTH & GOLDSTEIN, *supra* note 118, at 235–36.

143. *Id.* at 228–29. The TSCA Inventory is a list of chemicals already in commerce. *Id.*

releases.¹⁴⁴ Manufacturers are not required to test the chemical unless the EPA determines the chemical may present an unreasonable risk based on the severity of the hazard or level of exposure, and the EPA goes through a formal rulemaking process to order testing.¹⁴⁵ Any person can bring a civil action in federal court for violations of TSCA or to compel the EPA Administrator to perform any nondiscretionary act or duty.¹⁴⁶ State and local government regulations are expressly preempted unless the requirements of an exception are met.¹⁴⁷

The regulatory tools provided by TSCA can act as upstream interventions by preventing manufacture, importation, or new uses of PFAS. Because there are so many PFAS already in existence, the EPA should use Premanufacture Notices to prevent new PFAS from being created or imported to the maximum extent possible. This would keep the already complicated mixture of PFAS that humans are exposed to from being complicated even further.

C. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (“CERCLA”),¹⁴⁸ also known as the “Superfund Act,” was enacted to address toxic chemical releases.¹⁴⁹ CERCLA’s definition of hazardous substances incorporates by reference substances regulated by other federal environmental statutes.¹⁵⁰ Additional substances may be designated as hazardous for purposes of CERCLA if they present a “substantial danger to the public health or welfare or the environment.”¹⁵¹ A release is broadly defined as “any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant).”¹⁵² The requirements to report a release are based on the reportable quantity designated by the EPA for a particular type of hazardous substance.¹⁵³ The response measures available under CERCLA include removal of short-term danger following a release and can be followed by more thorough remedial measures that work to permanently eliminate or neutralize the hazard.¹⁵⁴ Remedial action is only available if a hazardous waste site is on the National Priorities List.¹⁵⁵

144. *Id.* at 229.

145. *Id.* at 229–31.

146. 15 U.S.C. § 2619.

147. 15 U.S.C. § 2617.

148. 42 U.S.C. §§ 9601–28, 9651–52, 9654–62, 9671–75; 26 U.S.C. §§ 4611–12, 4661–62.

149. *See* CARRUTH & GOLDSTEIN, *supra* note 118, at 132–33.

150. 42 U.S.C. § 9601(14).

151. 42 U.S.C. § 9602(a).

152. 42 U.S.C. § 9601(22).

153. CARRUTH & GOLDSTEIN, *supra* note 118, at 136.

154. *Id.* at 138–39.

155. *Id.* at 139.

At this point, none of the PFAS chemicals are designated as hazardous substances, but both the executive and legislative branches are considering this move.¹⁵⁶ Under CERCLA, federal facilities, like the military facilities linked to PFAS drinking water contamination, can be required to clean up toxic chemical spills, extending to areas where the spill has migrated beyond the facility.¹⁵⁷ The cleanup costs would have to be paid for by funds appropriated to the agency liable for the release, and states would not have to contribute to cleanup costs at these federal facilities.¹⁵⁸ This may provide some relief for states that lack adequate financial resources to address PFAS contamination caused by releases related to federal agencies, like the sites related to military use of AFFF. Because CERCLA imposes strict liability, cleanup can be required even for non-negligent exposures.¹⁵⁹ However, until some PFAS are designated as hazardous substances, the EPA will not have any authority under CERCLA to order cleanup for any releases.¹⁶⁰

D. Constitutional Principles

Application of constitutional principles to environmental law may seem inappropriate, given that environmental law is primarily dictated by statutes and administrative action and the environment is not mentioned in the U.S. Constitution.¹⁶¹ Yet Robin Kundis Craig argues in her book, *The Clean Water Act and the Constitution*, that

[i]t is precisely because environmental protection is *not* a constitutional issue that it is always already disadvantaged by issues that *do* have a constitutional basis—issues such as federalism, Congress’[s] Commerce Clause authority, . . . federal court jurisdiction, and separation of powers, all of which at least potentially limit environmental law.¹⁶²

156. Benesh, *supra* note 26.

157. *Id.*

158. *See id.* However, CERCLA does require states to pay part of the cost of cleanup at nonfederal sites. *Id.*

159. *See id.*

160. *Id.*

161. *See* ROBIN KUNDIS CRAIG, *THE CLEAN WATER ACT AND THE CONSTITUTION* 1–2 (2d ed. 2009).

162. *Id.* at 4 (emphasis in original).

Public health law,¹⁶³ on the other hand, relies upon the Constitution to determine the powers of the federal, state, and local governments to address public health issues.¹⁶⁴ The Constitution is a source of limited power for the federal government; in public health, as is often the case, the source of congressional power comes from the power to regulate interstate commerce or the tax and spend power.¹⁶⁵ In contrast, state governments have plenary power to promote public health and safeguard the welfare of their citizens, often called the “police power.”¹⁶⁶

The U.S. Constitution also sets forth a negative constitutional rights regime protecting individuals’ freedom *from* government interference, rather than a positive rights regime that places affirmative obligations on government.¹⁶⁷ The Due Process Clauses of the Fifth and Fourteenth Amendments protect both fundamental and nonfundamental rights.¹⁶⁸ While other countries around the world are recognizing a constitutional right to a clean environment,¹⁶⁹ substantive due process rights are only considered fundamental in the United States if they are fundamental to ordered liberty as determined by American history and tradition.¹⁷⁰ Fundamental rights are more protected, as, when defending government action, the government must show both a compelling interest and that the means chosen to limit a recognized right were the least restrictive alternative and necessary to achieve that interest for the infringement to be considered constitutional.¹⁷¹ Nonfundamental rights, on the other hand, are subject only to the rational basis test, which is highly deferential to

163. Professors Lawrence O. Gostin and Lindsay F. Wiley have defined the field of public health law as:

the study of the legal powers and duties of the state to assure the conditions for people to be healthy (to identify, prevent, and ameliorate risks to the health in the population) and the limitations on the power of the state to constrain the autonomy, privacy, liberty, proprietary, or other legally protected interests of individuals for the common good. The prime objective of public health law is to pursue the highest possible level of physical and mental health in the population, consistent with the values of social justice.

LAWRENCE O. GOSTIN & LINDSAY F. WILEY, *PUBLIC HEALTH LAW: POWER, DUTY, RESTRAINT* 4 (3d ed. 2016).

164. See JAMES G. HODGE, JR., *PUBLIC HEALTH LAW IN A NUTSHELL* 33 (3d ed. 2014).

165. LAWRENCE O. GOSTIN & LINDSAY F. WILEY, *PUBLIC HEALTH LAW AND ETHICS: A READER* 123–24 (2018).

166. *Id.* at 115; see also *Jacobson v. Massachusetts*, 197 U.S. 11, 24–25 (1905) (“According to settled principles, the police power of a state must be held to embrace, at least, such reasonable regulations established directly by legislative enactment as will protect the public health and the public safety.”).

167. David P. Currie, *Positive and Negative Constitutional Rights*, 53 U. CHI. L. REV. 864, 864–65 (1986); see also *Jackson v. City of Joliet*, 715 F.2d 1200, 1203 (7th Cir. 1983).

168. ERWIN CHEMERINSKY, *CONSTITUTIONAL LAW* 950, 952–53 (5th ed. 2017).

169. CRAIG, *supra* note 161, at 302–03.

170. *Washington v. Glucksberg*, 521 U.S. 702, 720–21 (1997).

171. CHEMERINSKY, *supra* note 168, at 954. This test is known as the strict scrutiny test.

government determinations.¹⁷² Under the rational basis test, the challenger must prove the government was acting arbitrarily or irrationally, which can be rebutted by a post-hoc showing of a rational relationship between a legitimate government interest and the means chosen, which need not be the actual reason for infringing upon the right.¹⁷³

In this context, an asserted fundamental right would have to be framed as freedom from contaminated water to fit within the negative rights regime.¹⁷⁴ The right to bodily integrity¹⁷⁵ is the closest related recognized fundamental right to which one could compare freedom from contaminated water. This argument would be an uphill battle, as courts have consistently refused to recognize environmental rights as within the penumbra of other fundamental rights and asserting “new” fundamental rights is disfavored.¹⁷⁶

PFAS contamination in drinking water is so ubiquitous that an estimated 99% of the population has at least one PFAS chemical in their bloodstream.¹⁷⁷ Babies, who are the most affected by chemical exposures due to their low body mass, have been born with PFAS in their blood.¹⁷⁸ Humans cannot survive without consuming water, and there is no way to completely avoid exposure. As discussed above, studies are finding links between PFAS exposure and chronic health conditions. It was not until recently that the public learned about PFAS contamination and how pervasive it is, drawing widespread concern from communities.¹⁷⁹ Individuals have been robbed of their ability to make decisions about what they want to put into their bodies because the federal government decided to allow manufacturers to continue to proliferate thousands of PFAS into the market for decades when it had knowledge that the chemicals posed a threat to health. Now that there is public attention to the problem, the EPA is finally stepping in.

Just as there is a general constitutional right to refuse medical treatment,¹⁸⁰ there ought to be a right to not be forced to consume toxic chemicals that will build up in the body with each additional exposure. If this right were recognized, there

172. Jane R. Bambauer & Toni M. Massaro, *Outrageous and Irrational*, 100 MINN. L. REV. 281, 297–99 (2015).

173. *See id.*

174. *See* Toni M. Massaro & Ellen Elizabeth Brooks, *Flint of Outrage*, 93 NOTRE DAME L. REV. 155, 183 (2017). Unenumerated rights recognized as fundamental under this doctrine include, *inter alia*, voting, family autonomy, travel, and medical decisions. CHEMERINSKY, *supra* note 168, at 949.

175. *Glucksberg*, 521 U.S. at 720 (citing *Rochin v. California*, 342 U.S. 165 (1952)).

176. CRAIG, *supra* note 161, at 299–300.

177. First Amended Complaint, *supra* note 104, at 13–14.

178. *See* Olga Naldenko, *Children’s Exposure to PFAS Chemicals Begins in the Womb*, ENVTL. WORKING GRP. (Feb. 5, 2019), <https://www.ewg.org/news-and-analysis/2019/02/children-s-exposure-pfas-chemicals-begins-womb>.

179. *See* Jeff B. Kray & Sarah J. Wightman, *Contaminants of Emerging Concern: A New Frontier for Hazardous Waste and Drinking Water Regulation*, NAT. RES. & ENV’T, Spring 2018, at 36, 36.

180. CHEMERINSKY, *supra* note 168, at 1069.

would be an additional challenge of creating limiting principles to avoid a seemingly limitless right, which are also disfavored. The advantage to recognizing freedom from contaminated water as a fundamental right would require the government to satisfy strict scrutiny if it took action that promoted or facilitated water pollution.¹⁸¹

However, all is not lost if a fundamental right is not found. Nonfundamental rights are reviewed under the rational basis test,¹⁸² and outrageous government conduct that shocks the conscience is a violation of due process.¹⁸³ These standards are highly deferential to the government,¹⁸⁴ but it is possible for a claim to succeed under either principle.¹⁸⁵ To some extent, the EPA and DOD had knowledge that PFAS were present in drinking water and called them “toxic” by 2001.¹⁸⁶ Though armed with that knowledge, the DOD did not begin investigation until 2014,¹⁸⁷ and the EPA did not list any PFAS on the Drinking Water Candidate Contaminant List until 2016.¹⁸⁸ There is some evidence that the chemical manufacturers led the EPA to believe PFAS were safe,¹⁸⁹ but the DOD employee’s 2001 letter quoted the EPA’s own studies calling PFOA and PFOS “toxic.”¹⁹⁰ If allowing industry to profit off of poisoning the American people is not considered shocking to the conscience, it is hard to imagine what is.

III. WHERE DO WE GO FROM HERE?

The U.S. Congress is trying to speed up EPA action on this issue by requiring the EPA to use many of the available statutory tools this Note discussed in Part II.¹⁹¹ On January 10, 2020, the House of Representatives passed H.R. 535

181. For example, the EPA imposed a \$16,500,000 fine on DuPont following the lawsuit over its willful contamination of rivers in Parkersburg, West Virginia. 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>. While that fine was the largest civil penalty imposed at the time, it “represented less than 2 percent of profits earned by DuPont on PFOA [in 2005].” *Id.* This kind of leniency did little to deter similar industries from contaminating the environment with PFAS, which continues to this day. A fundamental right to clean water would require the government to justify such inadequate penalties.

182. CHEMERINSKY, *supra* note 168, at 952.

183. Rochin v. California, 342 U.S. 165, 172 (1952).

184. Massaro & Brooks, *supra* note 174, at 184.

185. For example, in the context of an equal protection claim, changes to the food stamp program stemming from the “bare congressional desire to harm a politically unpopular group” did not satisfy the rational basis test. U.S. Dep’t of Agric. v. Moreno, 413 U.S. 528, 534 (1973).

186. Bagenstose, *supra* note 27.

187. *Id.*

188. PFAS ACTION PLAN, *supra* note 8, at 14; *see CCL and Regulatory Determination*, *supra* note 64.

189. First Amended Complaint, *supra* note 104, at 11.

190. Bagenstose, *supra* note 27.

191. *See* H.R. 535, 116th Cong. (as received in Senate, Jan. 13, 2020). This Note addresses only the key components of the bill as relevant to the statutes and preventative measures discussed above.

with bipartisan support.¹⁹² The bill, which would create the momentum needed to adequately address this issue, pended before the Senate Committee on Environment and Public Works prior to the novel coronavirus pandemic.¹⁹³ As currently written, this bill would require the EPA to designate PFOA and PFOS as hazardous substances under CERCLA within a year of its enactment.¹⁹⁴ In the EPA's PFAS Action Plan, the anticipated completion for designating PFOA and PFOS as hazardous substances was supposed to be some time before the end of 2019, but this did not come to fruition.¹⁹⁵ If enacted, this congressional mandate would go even further than the PFAS Action Plan by requiring the EPA Administrator to determine whether to designate *all* PFAS as hazardous substances under CERCLA within five years.¹⁹⁶

Despite constituting the EPA's short- and long-term goals to address the crisis, the PFAS Action Plan did not include setting MCLs under the SDWA for any PFAS other than PFOA and PFOS that have contaminated the environment.¹⁹⁷ H.R. 535 would amend the SDWA by adding a PFAS-specific subsection to 42 U.S.C. § 300g-1(b).¹⁹⁸ This amendment would mandate that the EPA promulgate MCLs for PFAS within two years of its enactment and at minimum create MCLs for PFOA and PFOS.¹⁹⁹ It also goes further than the PFAS Action Plan because it would require the EPA to add all PFAS to the lists of monitored unregulated contaminants and contaminants considered for regulation.²⁰⁰ Similarly, H.R. 535 contains an amendment to another section of the SDWA that would establish a grant program for community water systems to obtain the technology needed to remove PFAS from drinking water,²⁰¹ which is crucial for meeting the MCL standards.

Beyond requiring regulation, enforcement, and cleanup, H.R. 535 contains preventative measures. For example, it would establish a labelling program under the Food, Drug, and Cosmetic Act that would make it easier for consumers to know which products do not contain PFAS.²⁰² Given the ubiquity of PFAS in household products, this is key to reducing the bioaccumulation that results from daily incremental exposure to PFAS. The bill prevents further water contamination by phasing out firefighting foams containing PFAS, specifically requiring the EPA to investigate methods of preventing GenX, a short-chain PFAS, contamination of

192. The bill passed with the support of 223 Democrats and 24 Republicans. *Final Results for Roll Call 13*, CLERK OF THE U.S. HOUSE OF REPRESENTATIVES, <http://clerk.house.gov/evs/2020/roll013.xml> (last visited Apr. 24, 2020).

193. *H.R. 535—PFAS Action Act of 2019: All Actions H.R. 535—116th Congress (2019-2020)*, CONGRESS.GOV, <https://www.congress.gov/bill/116th-congress/house-bill/535/all-actions?q=%7B%22search%22%3A%5B%22hr535%22%5D%7D&s=1&r=1> (last visited Apr. 24, 2020).

194. H.R. 535 § 2(a).

195. See PFAS ACTION PLAN, *supra* note 8, at 3 tbl.1.

196. H.R. 535 § 2(b).

197. See PFAS ACTION PLAN, *supra* note 8, at 3 tbl.1.

198. H.R. 535 § 5.

199. *Id.*

200. *Id.*

201. *Id.* § 7.

202. *Id.* § 10.

surface waters and to demand disclosure from industrial actors before introducing PFAS into water sources.²⁰³

While H.R. 535 would effectively protect the public's health through a multi-faceted approach, it is not without heavy opposition. For example, the U.S. Chamber of Commerce and several industrial organizations wrote a letter to the House of Representatives in opposition of the bill, claiming it “circumvent[s] existing regulatory authorities” and arguing that “[a]ny federal action should not address PFAS as a class or with predetermined outcomes, but rather should be based on sound science and the weight of the scientific evidence.”²⁰⁴ Granted, scientific evidence about health effects of PFAS is still developing, but it does exist²⁰⁵ and will provide additional clarification over time. The EPA also remains free to revise the MCLs as more scientific data is released and closes in on what levels, if any, will not cause health effects. On the same day that the Chamber of Commerce's letter was sent, Republican Senator John Bassaro was reported as saying, “It has no prospects in the Senate . . . [n]one.”²⁰⁶ The White House has also threatened to veto the bill if it does pass in the Senate.²⁰⁷

This bill is a step in the right direction on the federal level. If it does not pass, states will be forced to continue experimenting with regulations that may not be protective enough of their citizens. Should H.R. 535 not become law, which seems likely given that nothing has happened to the bill since January 2020, the EPA should still take a broader and faster approach than is currently laid out in the PFAS Action Plan. Additionally, the EPA should ensure it takes the interests of marginalized communities into account when it makes decisions regarding PFAS.

Like many environmental problems,²⁰⁸ PFAS have disparate impacts on marginalized communities.²⁰⁹ It has long been established that communities of color and those of low socioeconomic status are more likely to be exposed to

203. *Id.* §§ 11–13.

204. Letter from U.S. Chamber of Commerce to Members of the U.S. House of Representatives on H.R. 535, the “PFAS Action Act” (Jan. 8, 2020), <https://www.uschamber.com/letters-congress/coalition-letter-hr-535-the-pfas-action-act>.

205. *Supra* Section I.B.

206. David Schultz, *House PFAS Bill Has ‘No Prospects’ in Senate, Barraso Says (1)*, BLOOMBERG L. (Jan 8, 2020), <https://news.bloomberglaw.com/environment-and-energy/house-pfas-bill-has-no-prospects-in-senate-barraso-says>; *see also* Zack Budryk, *Top Republican: ‘Forever Chemical’ Bill Has ‘No Prospects’ in Senate*, HILL (Jan. 8, 2020), <https://thehill.com/policy/energy-environment/477363-top-republican-forever-chemical-bill-has-no-prospects-in-senate>.

207. Schultz, *supra* note 206; *see also* Budryk, *supra* note 206.

208. *See generally* Anita Desikan et al., *Abandoned Science, Broken Promises*, UNION OF CONCERNED SCIENTISTS (Oct. 23, 2019), https://www.ucsusa.org/resources/abandoned-science-broken-promises?_ga=2.248045701.382350003.1581106818-849383921.1581106818.

209. Genna Reed, *PFAS Contamination Is an Equity Issue, and President Trump’s EPA Is Failing to Fix It*, UNION OF CONCERNED SCIENTISTS (Oct. 30, 2019), <https://blog.ucsusa.org/genna-reed/pfas-contamination-is-an-equity-issue-president-trumps-epa-is-failing-to-fix-it>.

environmental contaminants.²¹⁰ Inaction at the federal level leaves state and local governments with the daunting task of engaging in regulation and cleanup with already overburdened and significantly smaller budgets. Health disparities will only be reinforced because state and local funding is largely dependent on the population's income and property value within the area. The National Environmental Justice Advisory Council wrote to the EPA Administrator in 2019 advocating for the EPA to expand its activities beyond those outlined in the PFAS Action Plan.²¹¹ More legislation like H.R. 535, which would both add a PFAS Infrastructure Grant Program to the SDWA to help communities install cleanup technologies at their water treatment systems and give priority to "disproportionately exposed communities,"²¹² is needed as one of many interventions designed to promote health equity and address environmental injustices.

CONCLUSION

PFAS contamination is pervasive and cannot be resolved through natural processes. While it is important that state and local governments and public health departments be allowed to take action, national drinking water standards promulgated by the EPA for all PFAS are needed to set the regulatory floor. Furthermore, production of new PFAS chemicals should be halted wherever possible in favor of investment in developing new technologies to remove PFAS from the environment and the human body, and to develop safe alternatives to PFAS. In addition, states should be free to set their own drinking water standards for PFAS that are more protective than a federal standard. Finally, litigation and federal legislation may help state and local governments carry out the remedial measures required to make America's drinking water safer to consume by obtaining funding from polluters and the federal government. An issue of this magnitude requires a multi-pronged approach that takes advantage of cooperative federalism and pays particular attention to the impacts on marginalized communities who are disproportionately affected by PFAS contamination. These efforts come with costs but also carry the hope that future generations of Americans will not have to suffer the health consequences associated with PFAS exposure if we properly utilize the legal and environmental health tools at our disposal.

210. See, e.g., Ihab Mikati et al., *Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status*, 108 AM. J. PUB. HEALTH 480, 480 (2018).

211. Letter from Richard Moore, Chair, Nat'l Envtl. Just. Advisory Council, to Andrew Wheeler, Adm'r, U.S. Envtl. Prot. Agency on Recommendations to Strengthen the PFAS Action Plan (Aug. 14, 2019), https://www.epa.gov/sites/production/files/2019-10/documents/nejac_letter_pfas-pfoa.pdf.

212. H.R. 535, 116th Cong. §7 (as received in Senate, Jan. 13, 2020). The term "disproportionately exposed community" is defined as "a community in which climate change, pollution, or environmental destruction have exacerbated systemic racial, regional, social, environmental, and economic injustices by disproportionately affecting indigenous peoples, communities of color, migrant communities, deindustrialized communities, depopulated rural communities, the poor, low-income workers, women, the elderly, the unhoused, people with disabilities, or youth." *Id.*