THE COST OF PFAS CLEANUP IN WATERWAYS: *WHO PAYS AND HOW?*

Sarah E. Mische*

It is now widely known that per- and polyfluoroalkyl substances (PFAS) pose serious environmental and health risks. A particular aspect of PFAS contamination occurs in water, including drinking water, groundwater, drainage and runoff water, and sewage and wastewater. Since the early 2000s, the U.S. Environmental Protection Agency (EPA) has taken regulatory measures and issued guiding materials to address the reality of mass PFAS contamination. Additionally, lawsuits were filed against DuPont and Chemours (DuPont's spin-off company) and 3M, as the primary American manufacturers responsible for mass PFAS pollution. Specifically, in the multidistrict litigation No. 2-18-mn-2873-RMG (MDL 2873), 3M agreed to a settlement of $10.5 to $12.5 billion for polluting America's drinking water with PFAS.

Twenty-two states filed a motion to intervene on July 26, 2023, claiming the settlement's overly broad indemnity and release provisions could block other and subsequent lawsuits' ability to impose damages on 3M. Sovereigns, states, tribal nations, U.S. territories, and public water entities cannot bear the costs of compliance on their own because that would ultimately place the financial burden on taxpayers who have already suffered the toxic consequences of PFAS pollution. The U.S. District Court for the District of South Carolina, chosen as the

*Sarah E. Mische is a Juris Doctor Candidate at the University of Colorado Law School, Class of 2025 and is a Production Editor for the *University of Colorado Law Review*. She received her B.A. in Politics with departmental honors from Willamette University in 2019. Prior to law school, she worked for The Honorable Thomas M. Hart at Marion County Circuit Court. My deepest thanks go to Catherine Ferri, Professor Jonathan Skinner-Thompson, Scott Clark, and Mary Slosson for insightful constructive criticisms in my earlier drafts. I also thank the dedicated *University of Colorado Law Review* editors, namely, Emma Plante, Devin Schultze, Natalie Tiggleman, Colleen Kennedy, Sarah Walker, Benjamin Johnson, Benjamin Yamada, and Maggie Mulhern for their exceptional work.

forum by the Judicial Panel on Multidistrict Litigation, amended the settlement, and it has been approved, passing the timeline for appeals. Ultimately, the costs of remediating PFAS in water by filtration, removal, storage, destruction, and disposal to comply with new set limits on PFAS in drinking water should fall on DuPont and 3M because they created this problem and knowingly continued to put Americans and America's natural resources at risk for their own profits.

This Comment focuses on EPA's slow, research-based regulation method and MDL 2873, investigating the PFAS regulatory conundrum and the necessary resulting litigation's ability to impose punishment and damages where they are due. Because vast PFAS pollution continued without sufficient EPA PFAS limits on manufacturers, the settlement should limit 3M's indemnity and releases, while protecting the interests of the other twenty-three sovereigns which are suing 3M and DuPont.[1] *Further, this Comment seeks to provide a solution to the environmental regulatory conundrum exemplified by PFAS, find a way to prevent ongoing mass contamination, and mitigate the need for massive court settlements as cost remedies.*

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INTRODUCTION

Decades before the U.S. Environmental Protection Agency (EPA) was founded in 1970, manufacturers created per- and polyfluoroalkyl substances (PFAS). Decades after, from 1970 to 2002, total PFAS production was about 100,000 tons.[2] The term PFAS describes thousands of man-made chemicals created in the 1940s for manufacturing and industrial processes, as well as consumer goods.[3] Following DuPont's accidental discovery of Teflon, a chemical coating used in non-stick pans, mass production of PFAS began shortly after the 1940s.[4] DuPont utilized a surfactant, which decreases surface tension, to prevent Teflon from clumping together during manufacturing.[5] This surfactant was perfluorooctanoic acid (PFOA), which belongs to the PFAS chemical group.[6] The other major producer of PFAS is 3M, which introduced perfluorooctane sulfonic acid (PFOS) in 1949 for use in Scotchguard, semiconductor devices, and an aqueous film-forming foam (AFFF) for firefighting.[7] PFAS are used in

2. LONG-CHAIN PERFLUORINATED CHEMICALS (PFCS) ACTION PLAN, U.S. EPA 4 (2009).

3. Isra Haider, Note, *Establishing a Strict Liability Standard for Releasing Per- and Polyfluoroalkyl Substances (PFAS) into the Environment*, 57 IND. L. REV. 199, 200 (2023); FACT SHEET: EPA'S PROPOSAL TO LIMIT PFAS IN DRINKING WATER, U.S. EPA 1 (Mar. 2023), https://www.epa.gov/system/files/documents/2023-04/Fact%20Sheet_PFAS_NPWDR_Final_4.4.23.pdf [https://perma.cc/TJ84-W2F2].

4. Noel M. Johnson, Note, *Me-FAS, You-FAS, We All Eat PFAS: What to Do About the Forever Chemical*, 21 PITTSBURGH J. TECH. L. & POL'Y 134, 135 (2021).

5. *Id.*

6. *Id.*

7. *Molecule of the Week Archive: Perfluorooctanesulfonic Acid*, AM. CHEM. SOC'Y (Jan. 28, 2019), https://www.acs.org/molecule-of-the-week/archive/p/perfluorooctanesulfonic-acid.html [https://perma.cc/8SYK-5KDS]; Sarah

consumer products like "stain and water-resistant materials" and paints beyond nonstick products like Teflon.[8] PFAS are also used in food packaging and various industry processes.[9]

PFAS are now widely called *forever chemicals*, a term coined by Harvard public health professor Joseph Allen to raise public awareness, because PFAS' structure is highly resistant to breakdown.[10] PFAS molecules are in part comprised of carbon and fluorine atoms chain-linked together—one of the strongest atomic bonds.[11] Because PFAS are identified by compounds of similar chemical structures, there are thousands of variants.[12] Currently, almost 15,000 synthetic PFAS chemicals are documented in the EPA's Computational Toxicology (CompTox) Chemicals Dashboard.[13] The carbon-fluorine bonds make the thousands of different PFAS variations "highly resistant to water, oil, and heat."[14] Bioaccumulation of PFAS thus has been a growing environmental and health conundrum since their creation.[15]

Brunswick, Note, *PFAS Are Forever: Why Unregulated Agricultural Water Is Not a Girl's Best Friend*, 54 ARIZ. ST. L.J. 253, 259 (2022); Craig T. Liljestrand, *PFAS Exposure: A Comprehensive Look at Emerging Facts and Studies, Risk and Liability Assessment, Litigation History, Evolving Regulations and Future Predictions*, DEF. COUNS. J., Apr. 2022, at 1, 2; Emma Schwartz, Note, *Too Little Too Late: Underregulation of Contaminants of Emerging Concern*, 52 ENV'T L. REP. 10964, 10967, 10974 (2022).

8. M. Elizabeth Goss, Note, *Rectifying the Safe Drinking Water Act and the Clean Water Act: Per- and Poly-Fluoroalkyl Substances (PFAS)—A Case Study*, 110 KY. L.J. 567, 577 (2022).

9. *Id.*

10. Brunswick, *supra* note 7, at 257; *see also* Faye Flam, *'Forever Chemicals' Deserve Far More EPA Scrutiny*, BLOOMBERG L. (Mar. 18, 2023), https://www.bloomberglaw.com/bloomberglawnews/environment-and-energy/X6DCFLHG000000?bna_news_filter=environment-and-energy [https://perma.cc/76P6-R832].

11. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, NAT'L INST. OF ENV'T HEALTH SCI., https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm [https://perma.cc/C3K9-KX3H] (last updated Jan. 6, 2025).

12. Mark P. Nevitt & Robert V. Percival, *Can Environmental Law Solve the 'Forever Chemical' Problem?*, 57 WAKE FOREST L. REV. 239, 249 (2022); Goss, *supra* note 8, at 577.

13. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*, *supra* note 11; *CompTox Chemicals Dashboard Navigation Panel to PFAS Structure Lists*, U.S. EPA, https://comptox.epa.gov/dashboard/chemical-lists/PFASSTRUCT [https://perma.cc/B2FG-CANV].

14. Nicholas "Hoo" Ray, *Emerging Trends in PFAS Litigation*, 52 TEX. ENV'T L.J. 73, 74 (2023).

15. Johnson, *supra* note 4, at 137.

PFAS can be categorized as *long-chain* or *short-chain* based on the length of the carbon molecules attached.[16] Long-chain PFAS—specifically, PFOS and PFOA—have been the focus of many studies in the United States.[17] Manufacturing of PFOA ended in 2015 due to the EPA's stewardship program, which invited eight leading companies, including 3M and DuPont, to voluntarily work towards eliminating PFOA within the program guidelines.[18] PFOS still has limited ongoing uses, but manufacturing has not met the mandatory reporting level since 2002.[19] Short-chain PFAS, like GenX Chemicals (GenX) and perfluorobutane sulfonic acid (PFBS), for example, were seen as safe alternatives.[20] Chemours created GenX[21] to replace PFOA, and PFBS has been used to replace PFOS.[22] Even though long-chain PFAS have been largely phased out and replaced by short-chain PFAS, research suggests other variables besides chain length affect bioaccumulation and toxicity.[23] For example, studies show that short-chain PFAS are *equally* environmentally persistent and are often harder to filter out due to their size.[24] Emerging data on short-chain PFAS' environmental persistence are alarming, especially because manufacturers need more short-chain PFAS to obtain similar performance to long-chain PFAS.[25] Additionally, given their

16. Brunswick, *supra* note 7, at 258–59.

17. *Id.* at 257.

18. *Id.*; *Fact Sheet: 2010/2015 PFOA Stewardship Program*, U.S. EPA, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program [https://perma.cc/8NUR-3Y6K] (last updated Mar. 18, 2024).

19. *Fact Sheet: 2010/2015 PFOA Stewardship Program*, *supra* note 18. *See generally* Certain Perfluoroalkyl Sulfonates, 40 C.F.R. § 721.9582 (2013) (setting forth mandatory reporting levels).

20. Brunswick, *supra* note 7, at 259, 261.

21. "GenX" is Chemours' trade name for hexafluoropropylene oxide-dimer acid (HFPO-DA) and its ammonium acid. U.S. EPA, DRINKING WATER HEALTH ADVISORY: HEXAFLUOROPROPYLENE OXIDE (HFPO) DIMER ACID (CASRN 13252-13-6) AND HFPO DIMER ACID AMMONIUM SALT (CASRN 62037-80-3), ALSO KNOWN AS "GENX CHEMICALS" 1–2 (June 2022), https://www.epa.gov/system/files/documents/2022-06/drinking-water-genx-2022.pdf [https://perma.cc/564L-RTH6].

22. Brunswick, *supra* note 7, at 259, 261.

23. U.S. EPA, EPA 823R18004, EPA'S PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) ACTION PLAN 11 (2019).

24. *Id.*; Erica Gagliano et al., *Removal of Poly- and Perfluoroalkyl Substances (PFAS) from Water by Adsorption: Role of PFAS Chain Length, Effect of Organic Matter and Challenges in Adsorbent Regeneration*, WATER RSCH., 2020, at 13.

25. Alessandro Presentato et al., *On the Ability of Perfluorohexane Sulfonate (PFHxS) Bioaccumulation by Two Pseudomonas sp. Strains Isolated from*

increase in global production and use, short-chain PFAS exposure is expected to grow.[26] As EPA has tried to understand PFAS chemicals, it continuously obtained data exposing a large, expanding PFAS chemical class, signifying a broader scope of PFAS pollution and associated risks. EPA's research-based regulation strategy has not successfully addressed PFAS because each research step opens a new can of worms to investigate. Accordingly, more recent action regarding PFAS now acknowledges the need to regulate short- and long-chain PFAS, particularly six common PFAS found in drinking water: PFOA, PFOS, PFNA, PFHxS, PFBS, and GenX.[27]

Because PFAS have been widely used and are environmentally persistent, most U.S. residents have been exposed to them.[28] A representative study of the U.S. population from 1999 to 2008 found 95 percent of participants had "measurable levels of PFAS in their blood."[29] Another representative study from 1999 to 2012 found PFOA and PFOS in 99 percent of collected blood samples.[30] Though blood serum[31] levels of PFOA and PFOS are declining after their manufacturing and use has essentially ceased, blood serum levels of short-chain and other long-chain PFAS are increasing.[32]

Accumulated research establishes that PFAS exposure, even at low levels, poses serious and wide-ranging health risks.[33] Depending on the particular PFAS exposure, adverse health outcomes include developmental defects, cancer, liver damage, immune effects, and thyroid effects.[34] The effects to the

PFAS-Contaminated Environmental Matrices, MICROORGANISMS, Jan. 2020, at 1, 2.

26. U.S. EPA, *supra* note 23, at 13.

27. *Id.* at 2.

28. *Id.* at 1.

29. Brunswick, *supra* note 7, at 257.

30. U.S. EPA, *supra* note 23, at 9.

31. Blood serum refers to the liquid that remains after the blood clotted. *Serum vs Plasma: Do You Know the Difference?*, CELL GUIDANCE SYS. (May 3, 2021), https://www.cellgs.com/blog/serum-vs-plasma-do-you-know-the-difference.html [https://perma.cc/WF86-NG9G].

32. Brunswick, *supra* note 7, at 266.

33. Civil Action No. 6:99-0488 (S.D. W.Va. 1998); Nevitt & Percival, *supra* note 12, at 249–50; Liljestrand, *supra* note 7, at 13.

34. The developmental defects include low birth weight, bone variations, accelerated puberty, and behavioral changes. Specific cancers include prostate, kidney, and testicular. U.S. EPA, *supra* note 23, at 13; *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, U.S. EPA, https://

immune system denote decreased ability to fight infection, warranting a determination from the National Toxicology Program that PFAS chemicals are an immune hazard.[35] Additional health risks include reproductive changes, like decreased fertility.[36] Such life-altering health consequences coupled with PFAS' persistence in the environment are serious threats to health and safety.

Americans are exposed to PFAS through a variety of means, including food packaging, consumer goods, air, and waterways.[37] PFAS infiltrate groundwater aquifers, "posing an imminent threat to water utilities and their customers who rely on safe drinking water."[38] In 2018, the Environmental Working Group, a research nonprofit geared towards modernizing industry standards, estimated that as many as 110 million Americans may have PFAS in their water.[39] PFAS originates from point sources[40] and through discharge or seepage pollutes water sources for downstream municipal and agricultural water users.[41] As of November 2024, around 143 million Americans live in communities with PFAS-contaminated water, and there are 8,865 contamination sites in the United States.[42] Public and private drinking water wells incur contamination from

www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas [https://perma.cc/8EZ2-JCGJ] (last updated May 16, 2024).

35. Goss, *supra* note 8, at 578.

36. *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, *supra* note 34.

37. Liljestrand, *supra* note 7, at 4–5.

38. Alec D. Tyra, *Persistent Environmental Pollutants and Water Utilities: The Argument for CERCLA Exemptions in Polyfluoroalkyl Substances (PFAS) Cleanup*, 17 ANIMAL & NAT. RES. L. REV. 187, 189 (2021).

39. Carly Johnson, *How the Safe Drinking Water Act & the Comprehensive Environmental Response, Compensation, and Liability Act Fail Emerging Contaminants: A Per- and Polyfluoroalkyl Substances (PFAS) Case Study*, 42 MITCHELL HAMLINE L.J. PUB. POL'Y & PRAC. 91, 111 (2021).

40. A point source is defined in the Clean Water Act as "any discernible, confined and discrete conveyance . . . from which pollutants are or may be discharged." 33 U.S.C. § 1362(14); 40 C.F.R. § 122.2 (definition as amended June 27, 2013).

41. Brunswick, *supra* note 7, at 255, 258. According to EPA, downstream uses of water cover state, interstate, and boundary-forming waters. *Protection of Downstream Waters in Water Quality Standards: Frequently Asked Questions*, U.S. EPA OFF. OF WATER (June 2014), https://www.epa.gov/sites/default/files/2018-10/documents/protection-downstream-wqs-faqs.pdf [https://perma.cc/PZF6-WF26].

42. *Mapping the PFAS Contamination Crisis: New Data Show 3,186 Sites in 50 States, the District of Columbia and Two Territories*, ENV'T WORKING GRP., https://www.ewg.org/interactive-maps/pfas_contamination [https://perma.cc/Z9B7-CF8T] (last updated Nov. 20, 2024).

firefighting foam runoff and manufacturing.[43] Additionally, wastewater treatment and landfills can contaminate waterways.[44] One of the most significant contributors to PFAS groundwater pollution is AFFF used for fuel fires on military bases and commercial airports.[45] A recent study from the U.S. Geological Survey (USGS) found that "on average" at least one PFAS is detected in about 45 percent of U.S. drinking-water samples.[46]

PFAS pollution flew under the radar until it came out in litigation discovery in the 1998 case *Tennant v. E.I. du Pont de Nemours & Company*—the first common-law tort action against PFAS manufacturers.[47] Considerable discovery production informed lead-attorney Rob Bilott that DuPont and 3M had "evidence of clear health and environmental impacts [of PFAS pollution] as early as 1976."[48] The companies conducted private studies investigating PFOA toxicity and "found adverse effects of PFOA exposure on test animals."[49] Furthermore, DuPont *knowingly* dumped more than 7,100 tons of toxic PFOA sludge into the Ohio River.[50] In 2001, shortly after Bilott's alarming revelations from discovery, he issued a letter to EPA, the U.S. Attorney General, and federal agencies disclosing the findings and urging quick action to address the public health and environmental threat PFAS pollution posed.[51] This was the

43. U.S. EPA, *supra* note 23, at 12.

44. *Id.*

45. Schwartz, *supra* note 7, at 10967; *see also* Johnson, *supra* note 4, at 136 (explaining that those locations engage in firefighting training, which compounds the pollution); Tyra, *supra* note 38, at 195.

46. Kelly L. Smalling et al., *Per- and Polyfluoroalkyl Substances (PFAS) in United States Tapwater: Comparison of Underserved Private-Well and Public-Supply Exposures and Associated Health Implications*, 178 ELSEVIER ENV'T INT'L 108033, 9 (2023); E.A. Crunden, *Almost Half of U.S. Tap Water Contains 'Forever Chemicals*,*'* E&E NEWS (July 5, 2023), https://www.eenews.net/articles/almost-half-of-u-s-tap-water-contains-forever-chemicals [https://perma.cc/AF63-RNYP].

47. Nevitt & Percival, *supra* note 12, at 242; Nadia Gaber et al., *The Devil They Knew: Chemical Documents Analysis of Industry Influence on PFAS Science*, ANNALS GLOB. HEALTH, June 2023, at 1, 2–3.

48. Gaber et al., *supra* note 47, at 2.

49. Nevitt & Percival, *supra* note 12, at 252.

50. *Leach v. E.I. du Pont de Nemours & Co. & Related Cases (Re PFOA Exposure & Contamination in the US)*, HARV. L. & INT'L DEV. SOC'Y (Mar. 16, 2020), https://media.business-humanrights.org/media/documents/files/documents/Dupont_case.pdf [https://perma.cc/UMD9-XTC2].

51. Michael DiGiannantonio, *A Legal History of PFAS*, WATER FIN. & MGMT. (Aug. 8, 2022), https://waterfm.com/a-legal-history-of-pfas [https://perma.cc/Y5KR-LBTV].

first time EPA was made aware of these concerns and studies.[52] Following this watershed moment, government agencies scrambled to research, understand, and properly address PFAS pollution; at the same time, plaintiffs filed voluminous personal injury litigation specifically against DuPont and 3M for diseases linked to PFAS exposure.[53]

This Comment seeks to untangle the complex web of PFAS water pollution and remediation liability. In doing so, it will delineate the implications of regulatory action and litigation regarding proper relief from PFAS contamination in water and liability on manufacturers for such relief. Beyond asking who pays and how, this Comment exposes and seeks to remedy the policy conundrum of ongoing mass water pollution from the vast and growing PFAS chemical class, inadvertently perpetuated by insufficient initial EPA action.

Part I argues that the slow and disjointed federal response to PFAS, coupled with feigned sufficiency of initial punitive action, created obstacles to holding DuPont and 3M accountable for remediation. Part I analyzes two of EPA's 2024 final rules: the PFAS National Primary Drinking Water Regulation (NPDWR) under the Safe Drinking Water Act (SDWA),[54] and the "hazardous substance" designation of PFOA and PFOS under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, nicknamed "Superfund").[55] This Comment also discusses EPA's current

52. Nevitt & Percival, *supra* note 12, at 252.

53. DiGiannantonio, *supra* note 51. The C8 Science Panel, comprised of three independent epidemiologists and tasked with determining links between PFOA exposure and disease, studied the nearly 70,000 participating class members' blood samples from the initial PFAS lawsuit. *Id.*

54. PFAS National Primary Drinking Water Regulation; Correction, 89 Fed. Reg. 49101 (June 11, 2024) (to be codified at 40 C.F.R. pt. 141) (effective June 15, 2024); PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18638 (proposed Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142); *see also Per- and Polyfluoroalkyl Substances (PFAS): Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) National Primary Drinking Water Regulation Rulemaking*, U.S. EPA, https://www.regulations.gov/docket/EPA-HQ-OW-2022-0114/unified-agenda [https://perma.cc/9539-ZCP2].

55. Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 89 Fed. Reg. 39124 (May 8, 2024) (to be codified at 40 C.F.R. pt. 302) (effective July 8, 2024); Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances, 87 Fed. Reg. 54415 (proposed Sept. 6, 2022) (to be codified at 40 C.F.R. pt. 302); *see also Proposed Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous*

proposed Resource Conservation and Recovery Act (RCRA) "hazardous constituents" designation for certain PFAS.[56] Part I ends with the combined impacts of these agency rules, particularly the PFAS NPDWR,[57] on sovereigns.

Part II analyzes litigation impacts on manufacturer financial liability for remediation, specifically multidistrict litigation (MDL) 2873 and lawsuits filed by state attorneys general. Part II then evaluates the need and effectiveness of litigation to enforce compensation.

Part III synthesizes the slow-moving policy conundrum and whack-a-mole litigation game, analyzing PFAS remediation solutions through the lens of corporate compliance and responsibility failures. Based on these considerations, this Comment argues that backwards-looking remediation and removal costs should be borne almost solely by 3M and DuPont. To achieve this, courts must manage settlement agreements to protect other pending and future claims which sovereigns and water utilities must bring to hold 3M and DuPont properly accountable. Additionally, EPA's authority must enable it to enjoin polluting companies for all toxic PFAS in the chemical class. Finally, to prevent another PFAS conundrum from slow regulation, EPA must revisit and rework the Toxic Substances Control Act (TSCA) to better enable suspension of certain production levels of all chemicals within a newly discovered toxic class during its data collection under its research-based regulatory response model.

I. REGULATORY ACTION REGARDING PFAS CONTAMINATION IN WATER

PFAS water pollution can be regulated in numerous ways. EPA can regulate PFAS in water under the Clean Water Act (CWA), which governs pollutant discharges and water quality

Substances, U.S. EPA, https://www.epa.gov/superfund/designation-perfluorooctanoic-acid-pfoa-and-perfluorooctanesulfonic-acid-pfos-cercla [https://perma.cc/EE4Q-QCMZ].

56. Listing of Specific PFAS as Hazardous Constituents, 88 Fed. Reg. 8606 (proposed Feb. 8, 2024) (to be codified at 40 C.F.R. pts. 261, 271); *see also Proposal to List Nine Per- and Polyfluoroalkyl Compounds as Resource Conservation and Recovery Act Hazardous Constituents*, U.S. EPA, https://www.epa.gov/hw/proposal-list-nine-and-polyfluoroalkyl-compounds-resource-conservation-and-recovery-act [https://perma.cc/JM77-WPRS] (last updated Apr. 10, 2024).

57. PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. at 18700.

standards,[58] or under the Safe Drinking Water Act (SDWA), which is primarily concerned with drinking water output.[59] EPA can also regulate PFAS as toxic chemical substances under Toxic Substances Control Act (TSCA) to restrict uses, or impose reporting, record-keeping, and testing requirements.[60] Finally, EPA can promulgate rules to designate certain PFAS chemicals as "hazardous substances" under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which ensures responsible party cooperation in hazardous waste cleanup[61] and as "hazardous waste" under the Resource Conservation and Recovery Act (RCRA).[62]

With so much information to learn and many possible approaches to regulate PFAS chemicals, EPA struggled to catch up and efficiently take action. Navigating how to best regulate PFAS requires an examination of each regulatory structure's functions and impacts. For example, the CWA's water quality standards are highly deferential to states[63] and operate on a chemical-by-chemical basis, further frustrating regulatory action targeting PFAS such that there are no set federal minimum water quality standards for PFAS to this day.[64]

58. Clean Water Act, 33 U.S.C. §§ 1251, 1311(a), 1314, 1317, 1321, 1361(a) (1972); *Summary of the Clean Water Act*, U.S. EPA, https://www.epa.gov/laws-regulations/summary-clean-water-act [https://perma.cc/XQX8-A7F6] (last updated June 12, 2024).

59. Safe Drinking Water Act, 42 U.S.C. §§ 300f–300j-27; *Summary of the Safe Drinking Water Act*, U.S. EPA, https://www.epa.gov/laws-regulations/summary-safe-drinking-water-act [https://perma.cc/69LA-HMZS] (last updated Jul. 31, 2024).

60. Toxic Substances Control Act, 15 U.S.C. §§ 2601–2629; *Summary of the Toxic Substances Control Act*, U.S. EPA, https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act [https://perma.cc/GF4Q-8WRV] (last updated Sept. 9, 2024).

61. Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601–9675 (2012); *Summary of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)*, U.S. EPA, https://www.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act [https://perma.cc/TV2M-AFXH] (last updated Jul. 31, 2024).

62. Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901–6992k; *Resource Conservation and Recovery Act (RCRA) Overview*, U.S. EPA, https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview [https://perma.cc/853G-4PJH] (last updated Sept. 11, 2024); *see* 40 C.F.R. pts. 260–273 (regulating hazardous waste disposal).

63. Goss, *supra* note 8, at 571. Importantly, the CWA *must* be highly deferential to states under the cooperative federal model.

64. *Id.* at 572, 584.

Though EPA's "technology-based regulation"[65] is ultimately a "logical and effective system to control industrial pollution,"[66] the process is painfully slow, especially given the breadth of PFAS pollution and PFAS chemicals. Ongoing research expanded these considerations and further complicated the task of figuring out how to properly remediate PFAS, thus exasperating pollution and shifting costs onto states, water utilities, and the public.

This Part aims to deconstruct the overwhelming task of regulating PFAS and to analyze the grave implications of delayed action. First, it addresses the logistics of PFAS remediation. Next, it evaluates EPA's initial response up to modern developments, indicating missed opportunities to effectively issue binding regulations and the failures of TSCA. It then outlines EPA's current rulemaking scheme under the SDWA, evaluating the cost burden placed on public water systems (PWS) instead of polluting companies. It also examines a parallel CERCLA designation for PFOA and PFOS, along with the new proposed rule to include nine PFAS as "hazardous constituents" under RCRA. This Part focuses on EPA's primary PFAS regulatory action within the SDWA creating high impacts on water utilities, and TSCA as EPA's primary way to regulate toxins. Ultimately, this Part sets forth the conundrum that sovereigns face in preparing to implement and pay for the first binding SDWA PFAS standards that took effect in 2024, with no current regulatory accountability being placed on polluting companies, namely 3M and DuPont.

A. The Problems of "Dealing" with PFAS

Remediating PFAS pollution is a highly complicated and expensive process, with EPA fighting an uphill battle against ongoing and incidental pollution. Federal guidance regarding PFAS water contamination has been slow because EPA typically "regulates specific chemicals, not classes or families of chemicals."[67] In other words, EPA action is best equipped to

65. Robert W. Adler & Carina E. Wells, *Plastics and the Limits of U.S. Environmental Law*, 47 HARV. ENV'T L. REV. 1, 23 (2023).

66. *Id.*

67. Ray, *supra* note 14, at 76. There are some exceptions to this general practice, like volatile organic compounds (VOCs) in the air quality context. *Technical Overview of Volatile Organic Compounds*, U.S. EPA, https://www.epa.gov

address each PFAS separately. As a chemical class with over 15,000 documented chemical variations,[68] "PFAS present a distinct regulatory challenge compared to other contaminants."[69] To avoid ineffectively regulating so many chemicals, EPA's focus has been research.[70] Such research included developing proper laboratory equipment and methods to measure PFAS in water, conducting toxicity assessments of PFAS on human health, and studying potential regulatory impacts on affected industries.[71]

Remediating PFAS pollution in water generally involves filtering the PFAS to remove them, then destroying and disposing of them.[72] For filtering, EPA recommends granular activated carbon filters, ion exchange resin, and high pressure membrane systems[73]—all above 90 percent effective.[74] Granular activated carbon filters absorb PFAS molecules[75] but short-chain PFAS can easily "slip through" and remain.[76] Ion exchange resins catch PFAS that stick to the resin.[77] Lastly, high pressure membrane systems, like nanofiltration and reverse osmosis,[78] are slightly more effective because they can filter out such small particles but remove so much that water needs to be remineralized after.[79]

/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds [https://perma.cc/YX3P-YHTU] (last updated Mar. 5, 2024).

68. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), supra* note 11; *CompTox Chemicals Dashboard Navigation Panel to PFAS Structure Lists*, *supra* note 13.

69. Ray, *supra* note 14, at 76.

70. Schwartz, *supra* note 7, at 10975.

71. *Id.*

72. *See generally* PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18638, 18684 (proposed Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142).

73. Haider, *supra* note 3, at 211.

74. Thomas Speth, *Session 3: PFAS Treatment in Drinking Water and Wastewater – State of the Science*, U.S. EPA OFF. RSCH. & DEV., slide 10 (Sept. 16, 2020), https://www.epa.gov/sites/default/files/2020-09/documents/r1-pfas_webinar_day_1_session_3_speth.pdf [https://perma.cc/4DPX-PGVP].

75. Haider, *supra* note 3, at 211.

76. Brunswick, *supra* note 7, at 265.

77. Haider, *supra* note 3, at 211–12.

78. THOMAS SPETH, TECHNOLOGIES FOR REDUCING PFAS IN DRINKING WATER, U.S. EPA OFF. RSCH. & DEV., https://www.epa.gov/sites/default/files/2019-10/documents/pfas_drinking_water_treatment_technology_options_fact_sheet_04182019.pdf [https://perma.cc/L8T5-CL4Y].

79. Cristina Tuser, *PFAS Removal Technologies*, WATER QUALITY PRODS. (Nov. 16, 2021), https://www.wqpmag.com/editorial-topical/pfas/article/10959837/pfas-removal-technologies [https://perma.cc/AF3L-MPTL].

EPA's formulated guidance for safely destroying and disposing of PFAS includes thermal treatment (i.e., incineration), landfilling, and underground injection wells.[80] PFAS filtered and removed with activated carbon are usually incinerated,[81] and used resin from ion exchange may also be incinerated.[82] There are two primary concerns with incineration. First, there are only twenty-two incinerators or kilns in the United States which can reach up to 3,000 degrees Fahrenheit and destroy PFAS.[83] Incineration thus will be too tedious to address the high volume of PFAS pollution. Second, if the destruction is incomplete, PFAS residual pollution will persist.[84] Landfilling at sites with specific paradigms for filtered PFAS also raises concerns because it only defers destruction and poses extra pollution risks from buildup seepage.[85] Finally, underground injection wells, which can only store liquid toxic waste,[86] also defer destruction and bring with them common issues associated with underground storage of toxic waste, like possible seepage.

Overall, the filtration, removal, destruction, and disposal of PFAS is a complex task that still poses risks of ongoing and incidental pollution. Difficulties addressing the effectiveness, accessibility, and unintended consequences of remediation processes are exacerbated by a regulatory scheme ill-equipped to handle a large class of highly toxic chemicals.

B. Initial EPA Action and Missed Opportunities

Initial regulatory action arose under the Toxic Substances Control Act (TSCA) in 2002 prior to its 2016 amendments from the Frank R. Lautenberg Chemical Safety Act.[87] EPA issued a

80. Haider, *supra* note 3, at 210.

81. Kerri Jansen, *'Forever Chemicals' No More? These Technologies Aim to Destroy PFAS in Water*, CHEM. & ENG'G NEWS (Mar. 25, 2019), https://cen.acs.org/environment/persistent-pollutants/Forever-chemicals-technologies-aim-destroy/97/i12 [https://perma.cc/HG6R-ER6G].

82. SPETH, *supra* note 78.

83. Haider, *supra* note 3, at 210.

84. *Id.*

85. *Id.*

86. *Id.* at 211.

87. EPA included two Significant New Use Rules in 2002, one in March including thirteen PFAS and one in December adding seventy-five PFAS. *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, U.S. EPA, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca

Significant New Use Rule (SNUR) for seventy-five PFAS substances, requiring any manufacturer or importer of the chemical(s) to notify EPA within ninety days prior to use.[88] Additionally, 3M cooperated with EPA and terminated its production of PFOS in 2002.[89] Though TSCA empowers EPA to regulate toxic chemicals which could harm public health and the environment,[90] its authority primarily focuses on testing, record-keeping, and reporting.[91] This leaves progress dependent on slow-moving research and voluntary efforts from industry actors. However, TSCA reporting requirements have some teeth as they mandate manufacturer disclosure subject to penalties for failure to comply.

In 2004, EPA took action against DuPont for violating disclosure requirements under a different section of TSCA.[92] That section instructs manufacturers who acquire information that a chemical substance used in their processes presents a "substantial risk of injury to health or the environment" to immediately inform the EPA administrator.[93] Continuing from Bilott's work in *Tennant*, EPA relied on disclosures of "information DuPont's own scientists had about PFOA toxicity and its presence in local drinking water samples."[94] DuPont ultimately settled in 2005 and paid EPA $16 million,[95] which was less than 2 percent of its profits earned that year.[96] Later, in 2007, 3M also settled with EPA for withholding critical PFAS

/risk-management-and-polyfluoroalkyl-substances-pfas [https://perma.cc/N6J2-XXZK] (last updated Oct. 4, 2024); Schwartz, *supra* note 7, at 10975; *see also* Frank R. Lautenberg Chemical Safety for the 21st Century Act, Pub. L. No. 114–82, 130 Stat. 448 (2016).

88. Section 5 of TSCA focuses on information gathering of new chemical substances. Significant New Uses of Chemical Substances, 40 C.F.R. pt. 721 (2002); TSCA § 5(a)(2) (15 U.S.C. § 2604(a)(2)) (enabling EPA to require notification in order to evaluate associated risks, make determinations, and further regulate if deemed appropriate).

89. *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 87; *Fact Sheet: 2010/2015 PFOA Stewardship Program*, *supra* note 18.

90. Nevitt & Percival, *supra* note 12, at 260; 15 U.S.C. §§ 2601, 2605.

91. While Section 5 focuses on new chemical substances, Section 4 allows authority to require manufacturer testing alongside found risks, and Section 8 pertains to information gathering. *Summary of the Toxic Substances Control Act*, *supra* note 60; 15 U.S.C. § 2603.

92. Nevitt & Percival, *supra* note 12, at 261; DiGiannantonio, *supra* note 51.

93. Notice to Administrator of Substantial Risks, 15 U.S.C. § 2607(e).

94. DiGiannantonio, *supra* note 51.

95. *Id.*

96. HARVARD LAW & INTERNATIONAL DEVELOPMENT SOCIETY, *supra* note 50.

information from its internal actions and paid $1.5 million in fines.[97]

After mitigating 3M's use of PFOS, EPA implemented its PFOA stewardship program in 2006.[98] The program set forth a commitment to achieving a 95 percent reduction of PFOA facility emissions and fully eliminating PFOA emissions and use in products by 2015.[99] During this program, it still took EPA three years to finally designate PFOA and PFOS as "contaminants potentially warranting regulation."[100] Following the 2009 designation, EPA expressed desires to regulate PFAS under TSCA because the program allows regulation by chemical class only based on whether they are known to cause harm.[101] The 2009 Long-Chain Action Plan set forth EPA's plans to develop assessments to satisfy the higher TSCA Section 6(a) rulemaking standard which requires that the chemical in question "presents or will present an unreasonable risk of injury to health or the environment."[102] Rulemaking under Section 6(a) offers substantially more bite than TSCA disclosure requirements as it gives EPA the authority to prohibit or limit such use in "manufacturing, processing, or distribution in commerce."[103]

However, TSCA regulation lost momentum due to its own limitations prior to the 2016 Amendment. After PFOA toxicity was fully established in 2011, inexplicably, no such TSCA rulemaking followed.[104] In 2015, EPA issued proposed rulemaking for a new long-chain Significant New Use Rule[105] but stalled five years until filing a second proposed Significant

97. DiGiannantonio, *supra* note 51.

98. *Fact Sheet: 2010/2015 PFOA Stewardship Program*, *supra* note 18. The companies were DuPont, Arkema, Asahi, BASF, Clariant, Daikin, 3M/Dyneon, and Solvay Solexis, HARVARD LAW & INTERNATIONAL DEVELOPMENT SOCIETY, *supra* note 50.

99. *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 87.

100. Brunswick, *supra* note 7, at 284.

101. U.S. EPA, *supra* note 2; Nevitt & Percival, *supra* note 12, at 261–62; 15 U.S.C. §2625(c)(2)(A)–(B) (establishing regulatory ability over a "category of chemical substances" and a "category of mixtures").

102. TSCA § 6(a); 15 U.S.C. § 2605(a); U.S. EPA, *supra* note 2.

103. TSCA § 6(a); 15 U.S.C. § 2605(a)(1)–(2).

104. *See* HARVARD LAW & INTERNATIONAL DEVELOPMENT SOCIETY, *supra* note 50 (indicating no such rulemaking in the timeline).

105. Significant New Use Rule for Long-Chain Perfluoroalkyl Carboxylates and Perfluoroalkyl Sulfonates, 80 Fed. Reg. 2885 (proposed Jan. 21, 2015).

New Use Rule in 2020.[106] Prior to TSCA's 2016 Amendment, it failed to give EPA sufficient authority to generate and supply information required to determine a chemical's lack of safety and even more importantly, restricted EPA to demonstrating the benefits of regulating outweighed the costs even for unreasonable risk determinations.[107] Further, EPA had to prove actual harm before controlling unsafe chemicals.[108] Such high limits on EPA authority and burdensome barriers stood in the way of meaningful TSCA binding control of PFAS.

After initial actions to (1) fine DuPont and 3M, (2) "crack down" on PFOA and PFOS uses, and (3) establish notice requirements under TSCA, testing and research were EPA's primary regulatory focuses. By 2015, PFOS had been phased out of production for about thirteen years, and PFOA was finally eliminated from production.[109] Despite that, risks of other long-chain PFAS, short-chain replacements, and environmental loading of PFAS contamination persisted.

C. The Regulatory Challenge Deepens

Instead of overcoming the obstacles and implementing binding regulations under the Toxic Substances Control Act (TSCA), which seemed unlikely given TSCA's limits, EPA turned to the Safe Drinking Water Act (SDWA) in 2012. The proposed SDWA rule included six PFAS in its third Unregulated Contaminant Monitoring Rule (UCMR 3) under the SDWA for public water systems.[110] This national monitoring of suspicious

106. The final rule was published July 27, 2020, and was effective September 25, 2020. *Significant New Use Rule for Long-Chain Perfluoroalkyl Carboxylates and Perfluoroalkyl Sulfonates*, REGULATIONS.GOV, https://www.regulations.gov/docket/EPA-HQ-OPPT-2013-0225/unified-agenda [https://perma.cc/8Z82-QUBG].

107. Richard A. Denison, *A Primer on the New Toxic Substances Control Act (TSCA) and What Led to It*, ENV'T DEF. FUND (Apr. 2017), https://www.edf.org/sites/default/files/denison-primer-on-lautenberg-act.pdf [https://perma.cc/QAP5-X8PW].

108. *Id.*

109. *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 87.

110. Nevitt & Percival, *supra* note 12, at 256; *Third Unregulated Contaminant Monitoring Rule*, U.S. EPA, https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule [https://perma.cc/58GX-Q4QB] (last updated June 10, 2024). The EPA's monitoring power over unregulated contaminants arises from the 1996 Safe Drinking Water Act Amendment. *Learn About the Unregulated Contaminant Monitoring Rule*, U.S. EPA, https://www.epa.gov/dwucmr/learn-

drinking water contaminants "provide[d] the occurrence and exposure data necessary to protect public health in future regulatory actions."[111] PFOA, PFOS, and key short-chain PFAS, PFBS, PFHxS, PFHpA, and PFNA were categorized as List 1 Contaminants for "assessment monitoring," which had the effect of enjoining all large and 800 small but representative public water systems.[112] It is notable that short-chain PFAS started being expressly included within EPA's regulatory monitoring and research.

Unregulated Contaminant Monitoring Rules (UCMRs) are developed by EPA from prior Contaminant Candidate Lists (CCLs),[113] which EPA must publish every five years.[114] These lists are comprised of substances in or anticipated to occur in public water systems which are not currently subject to drinking water regulations.[115] Notably, neither UCMRs nor CCLs bind manufacturers like 3M and DuPont; but, unlike UCMRs, CCLs do not impose any requirements on public water systems.[116] Instead, they instruct EPA to gather information, in part to implement a following UCMR for public water systems monitoring and ultimately to issue a regulatory determination for at least five listed contaminants under the National Primary Drinking Water Regulation (NPDWR).[117]

The 1996 SDWA Amendment established that the EPA administrator must conduct a cost-benefit analysis to justify a

about-unregulated-contaminant-monitoring-rule [https://perma.cc/VZ4V-J379] (last updated July 15, 2024); Safe Drinking Water Act Amendments of 1996, Pub. L. No. 104–82, 110 Stat. 1613.

111. Liljestrand, *supra* note 7, at 27.

112. U.S. EPA, THE THIRD UNREGULATED CONTAMINANT MONITORING RULE (UCMR 3): SEARCHING FOR EMERGING CONTAMINANTS IN DRINKING WATER (2012), https://www.epa.gov/sites/default/files/2015-10/documents/ucmr3_factsheet_general.pdf [https://perma.cc/D76L-NDPT].

113. *Learn About the Unregulated Contaminant Monitoring Rule*, *supra* note 110; *SDWA Evaluation and Rulemaking Process*, U.S. EPA, https://www.epa.gov/sdwa/sdwa-evaluation-and-rulemaking-process [https://perma.cc/9825-QSZK] (last updated June 24, 2024).

114. *Basic Information on the CCL and Regulatory Determination*, U.S. EPA, https://www.epa.gov/ccl/basic-information-ccl-and-regulatory-determination [https://perma.cc/476Z-MWMF] (last updated Feb. 7, 2024).

115. *Id.*

116. *See id.*; *Learn About the Unregulated Contaminant Monitoring Rule*, *supra* note 110.

117. *Basic Information on the CCL and Regulatory Determination*, *supra* note 114. Each regulatory determination is commonly abbreviated to "RegDet" with its according number.

NPDWR regulatory determination.[118] The contaminant must (1) have adverse health impacts, (2) contaminate or be likely to contaminate public water systems at frequencies and levels warranting public concern, and (3) in the EPA administrator's sole judgment, be able to be meaningfully addressed by regulation so that health risks for public water users are reduced.[119] CCL 3 listed PFOA and PFOS.[120] Including six PFAS in the subsequent UCMR 3[121] without a subsequent regulatory determination indicates not even PFOA and PFOS satisfied each element above.[122] Instead of issuing a regulatory determination including PFAS in 2016, EPA issued its 2016 Lifetime Health Advisory for PFOA and PFOS, *recommending*, but not *requiring*, a limit of seventy parts per trillion in drinking water.[123] Ten years after initial TSCA measures, EPA efforts still were not evolving to include actual drinking water enforcement. Even more importantly, the research reflects no continued enforcement against polluting companies beyond initial fines and the stewardship program.[124]

There are two flaws in EPA's approach under the SDWA. First, EPA's approach was unenforceable. Second, any binding UCMRs or regulatory determination affects public water systems, not *polluters*. In turning to the SDWA, EPA prioritized drinking water but also demonstrated its satisfaction with liability measures for DuPont and 3M. This left public water systems with an impossible conundrum: They could either voluntarily comply with the recommended levels and front the cost or legally ignore the pollution beyond any further required monitoring and reporting. Even though the advisory sparked increased PFAS testing in drinking water,[125] it further flouted

118. Safe Drinking Water Act Amendments of 1996, S. 1316, 104th Cong.; Johnson, *supra* note 39, at 103.

119. 42 U.S.C. § 300g.

120. *Contaminant Candidate List 3—CCL 3*, U.S. EPA, https://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3 [https://perma.cc/9579-V3D4] (last updated Nov. 22, 2024).

121. *Third Unregulated Contaminant Monitoring Rule*, *supra* note 110.

122. *Regulatory Determination 3*, U.S. EPA, https://www.epa.gov/ccl/regulatory-determination-3 [https://perma.cc/8DNP-DP4G] (last updated Mar. 1, 2024).

123. Lifetime Health Advisories and Health Effects Support Documents for Perfluorooctanoic Acid and Perfluorooctane Sulfonate, 81 Fed. Reg. 33250 (May 25, 2016); Liljestrand, *supra* note 7, at 24; *see also* Brunswick, *supra* note 7, at 284 (explaining that the 2016 Lifetime Health Advisories Notice followed research finding PFOA and PFOS in twenty-four state public water systems).

124. *Fact Sheet: 2010/2015 PFOA Stewardship Program*, *supra* note 18.

125. DiGiannantonio, *supra* note 51.

EPA's then seven-year-old broken promise of TSCA enforcement. Forgoing TSCA regulation due to serious limits in TSCA's statutory scheme in favor of public water system monitoring and non-binding SDWA standards frustrated, if not completely blocked, sustained regulatory accountability on polluting companies and wholistic limits on the PFAS chemical class.

As shown above, within the early 2000s and 2010s, the vast testing and research efforts provided scientists with alarming toxicity data that established the PFAS problem was significantly worse and broader than understood just years before. Navigating what PFAS to regulate—numerous specific variations or a class if possible—and formulating a regulatory approach with so many enforcement options and demands stifled EPA's rulemaking response. During EPA's ongoing interim period of research, it issued non-binding advisories and action plans to offer guidance before it felt it could properly promulgate rules.[126] The 2019 PFAS Action Plan established that EPA will "prioritize *preventing* environmental contamination and identifying approaches that reduce the costs of PFAS management faced by local communities."[127] However, having no concrete remediation or preventative regulatory enforcement is concerning, especially as short-chain PFAS have been adding to PFAS pollution for over twenty years. Though EPA rightly provided guidelines and demonstrated that more research is essential to address such a complex chemical class, it ignored the continued pollution occurring in tandem and the severe consequences.

D. Developed EPA Rulemaking: A Limited Breakthrough

Following the denial to include any PFAS in the third regulatory determination (RegDet 3), PFOA and PFOS were again listed on the fourth Contaminant Candidate List (CCL 4), issued in 2016.[128] Five years later in 2021, EPA published the fourth regulatory determination (RegDet 4), finally regulating PFOA and PFOS in drinking water.[129] Even though EPA turned

126. *See, e.g.*, U.S. EPA, *supra* note 23.
127. *Id.* at 42 (emphasis added).
128. *Regulatory Determination 4*, U.S. EPA, https://www.epa.gov/ccl/regulatory-determination-4 [https://perma.cc/F2WZ-U8U9] (last updated Mar. 15, 2024).
129. *Id.*

its focus to the Safe Drinking Water Act (SDWA), it still took twenty years from discovery for it to officially declare that PFOA and PFOS will be regulated under the SDWA. But now the ball was rolling for the SDWA. Issued later in 2021, Unregulated Contaminant Monitoring Rule 5 (UCMR 5) included short-chain PFAS, like PFNA, PFBS, GenX, and PFHxS,[130] providing the most comprehensive PFAS monitoring to date.[131] Published in 2022, CCL 5 subjected the PFAS chemical group to monitoring for the first time.[132] Furthermore, in 2023, EPA finally set an effluent limitation guideline plan for PFAS under the Clean Water Act (CWA) for industrial wastewater discharges.[133] This progress is good because it shows EPA actively reworking and adding regulatory developments based on its data collection and research. Again, unfortunately, UCMRs bind reporting obligations only on public water systems and CCLs only direct EPA action. Additionally, all National Primary Drinking Water Regulation (NPDWR) regulatory determinations under the SDWA and the CWA effluent guidelines can only enforce binding rules on a chemical-by-chemical basis.

Turning back to the Toxic Substances Control Act (TSCA), EPA's continued action also focused on regulatory research over actual enforcement, again indicating the breadth of PFAS and their toxicity became more apparent during the research. Starting in 2016, after the Frank R. Lautenberg Amendment, EPA was now directed to adopt a PFAS reporting rule in December 2020.[134] The PFAS reporting rule was proposed in

130. *Fifth Unregulated Contaminant Monitoring Rule*, U.S. EPA, https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule [https://perma.cc/DJH8-58JC] (last updated Aug. 1, 2024).

131. *Id.; Key EPA Actions to Address PFAS*, U.S. EPA, https://www.epa.gov/pfas/key-epa-actions-address-pfas [https://perma.cc/HG5J-FW49] (last updated Oct. 1, 2024).

132. *Fact Sheet: Fifth Contaminant Candidate List (CCL 5)*, U.S. EPA 5 (Oct. 2022), https://www.epa.gov/system/files/documents/2022-10/Fact%20Sheet%20Final%20Fifth%20Contaminant%20Candidate%20List%20%28CCL%205%29.pdf [https://perma.cc/DBJ7-KQ26].

133. *Current Effluent Guidelines Program Plan*, U.S. EPA, https://www.epa.gov/eg/current-effluent-guidelines-program-plan [https://perma.cc/2PFA-6NMR] (last updated July 17, 2024).

134. *TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances*, U.S. EPA, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping [https://perma.cc/KA8V-ENLU] (last updated Sept. 16, 2024); 15 U.S.C. § 2607(a)(7).

June 2021.[135] During this time, EPA also developed a "National PFAS Testing Strategy, demonstrating the ongoing data gaps stifling progress."[136] It was not until October 2023, seven years after the TSCA amendment expanded EPA's authority for chemical evaluation,[137] that EPA issued two final PFAS rules under TSCA.[138] However, the first rule is only concerned with electronic reporting from manufacturers and importers who used PFAS in any year since 2011.[139] Even though this rule is still focused on obtaining actionable data for PFAS research, it added at least 1,462 PFAS chemicals to the reporting requirements.[140] The second rule classifies PFAS as "chemicals of special concern" within the Toxic Release Inventory, which have increased reporting requirements and are not eligible for the de minimis exception.[141] Both new TSCA rules complement CCL 5, which lists the PFAS chemical class and expanded the regulatory scope. Though EPA took increased regulatory action,

135. *EPA Continues to Take Action on PFAS to Protect the Public*, U.S. EPA, https://www.epa.gov/chemicals-under-tsca/epa-continues-take-action-pfas-protect-public [https://perma.cc/YV7W-XC8H] (last updated June 4, 2024).

136. U.S. EPA, NATIONAL PFAS TESTING STRATEGY: IDENTIFICATION OF CANDIDATE PER- AND POLY FLUOROALKYL SUBSTANCES (PFAS) FOR TESTING (2021), https://www.epa.gov/system/files/documents/2021-10/pfas-natl-test-strategy.pdf [https://perma.cc/J7RQ-7N22].

137. Frank R. Lautenberg Chemical Safety for the 21st Century Act, Pub. L. No. 114–82, 130 Stat. 448 (2016).

138. Toxic Substances Control Act Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances, 40 C.F.R. pt. 705 (2023); *Changes to TRI Reporting Requirements for Per- and Polyfluoroalkyl Substances and to Supplier Notifications for Chemicals of Special Concern*, U.S. EPA, https://www.epa.gov/toxics-release-inventory-tri-program/changes-tri-reporting-requirements-and-polyfluoroalkyl [https://perma.cc/U6MD-3R9B] (last updated Oct. 31, 2023); Toxic Chemical Release Reporting, 40 C.F.R. pt. 372 (2023).

139. 40 C.F.R. pt. 705 (2023). *See generally TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances*, *supra* note 134 (explaining reporting covers "PFAS uses, production volumes, disposal, exposures, and hazards").

140. *EPA Finalizes Rule to Require Reporting of PFAS Data to Better Protect Communities from Forever Chemicals*, U.S. EPA (Sept. 28, 2023), https://www.epa.gov/newsreleases/epa-finalizes-rule-require-reporting-pfas-data-better-protect-communities-forever [https://perma.cc/2FNC-LDQY].

141. 40 C.F.R. pt. 372 (2023); *Changes to TRI Reporting Requirements for Per- and Polyfluoroalkyl Substances and to Supplier Notifications for Chemicals of Special Concern*, *supra* note 138. *See generally EPA's Final Rule Ends De Minimis Exemption for PFAS and Expands Supplier Notifications for Chemicals of Special Concern*, DUANE MORRIS LLP (Oct. 31, 2023), https://www.duanemorris.com/alerts/epas_final_rule_ends_de_minimis_exemption_pfas_expands_supplier_notifications_chemicals_1023.html [https://perma.cc/5WMU-5FXC] (explaining the de minimis exemption effectively allowed PFAS chemical mixtures and concentrations below 1 percent to bypass reporting).

the balance still weighed heavily towards research and monitoring as understanding the PFAS chemical class became increasingly complex.

E. The EPA's Current Rulemaking and its Limits

After a long wait, on March 29, 2023, EPA issued a proposed rule to regulate six PFAS under the Safe Water Drinking Act (SDWA).[142] The SDWA regulates drinking water as a matter of public health,[143] focusing on groundwater output and drinking water treatment.[144] EPA's authority under the SDWA enables it to set minimum drinking water standards for all public water systems.[145] Once a water contaminant is monitored under an Unregulated Contaminant Monitoring Rule (UCMR), identified in a Contaminant Candidate List (CCL), researched throughout this process, and set forth in a regulatory determination, EPA will finally set a maximum contaminant level goal to begin crafting the enforceable regulation under the National Primary Drinking Water Regulation (NPDWR).[146] Maximum contaminant level goals are best practice guidelines which only consider public health.[147] From there, EPA formulates a maximum contaminant level which actually binds public water systems once the primary standards go into effect.[148]

The SDWA PFAS rule sets a four parts per trillion maximum contaminant level for PFOA and PFOS, and imposes a 1.0 unitless hazard index for PFNA, PFHxS, PFBS, and GenX.[149] The maximum contaminant level must be at four parts

142. PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18638 (proposed Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142).

143. Brunswick, *supra* note 7, at 283.

144. Goss, *supra* note 8, at 570.

145. *Summary of the Safe Drinking Water Act*, *supra* note 59. Public water systems include state and local water systems and tribal nation water systems. *Information about Public Water* Systems, U.S. EPA, https://www.epa.gov/dwreginfo/information-about-public-water-systems [https://perma.cc/3ZVT-CF35] (last updated Oct. 30, 2024).

146. *How EPA Regulates Drinking Water Contaminants*, U.S. EPA, https://www.epa.gov/sdwa/how-epa-regulates-drinking-water-contaminants [https://perma.cc/59WT-VQGG] (last updated Nov. 2, 2023); 42 U.S.C. § 300g-1.

147. *How EPA Regulates Drinking Water Contaminants*, *supra* note 146.

148. *Id.*

149. *Proposed PFAS National Primary Drinking Water Regulation,* U.S. EPA OFF. OF WATER, slide 14 (Mar. 29, 2023), https://www.epa.gov/system/files/documents/2023-04/PFAS%20NPDWR%20Public%20Presentation_Full%20Technical%20Presentation_3.29.23_Final.pdf [https://perma.cc/3DA4-2VLD].

per trillion even though the maximum contaminant level goal was zero parts per trillion for PFOA and PFOS because that is the level at which they can be detected by current technology.[150] Effectively, this rule seeks to officially enforce the complete elimination of PFOS and PFOA, based on vast research informing EPA's determination that they are likely to be carcinogenic to humans.[151] The 1.0 hazard index for PFNA, PFHxS, PFBS, and GenX requires public water systems to monitor, measure, and compare the amount of these four PFAS to their associated Health Based Water Concentrations.[152]

Under this rule, EPA also addresses its 2019 plan to designate PFOS and PFOA as "hazardous substances" under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).[153] Regulating PFAS with maximum contaminant levels under the SDWA would not automatically establish PFAS as hazardous substances, so this is promulgated under another proposed rule, effective in 2024 alongside the SDWA NPDWR.[154] The CERCLA "hazardous substance" designation allows EPA to enforce strict liability on potentially responsible parties from which EPA can recover costs for remedying the contamination and damages regardless of actual fault.[155] Potentially responsible parties (PRPs) include owners or operators of facilities where a release occurred and parties who arrange for the disposal of "hazardous substances," now including PFOA and PFOS. CERCLA strict liability, upon

150. Haider, *supra* note 3, at 202.

151. U.S. EPA OFFICE OF WATER, *supra* note 149, at slide 9.

152. *Id.* at slide 10, 14.

153. PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18686 (proposed Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142); *See generally* U.S. EPA, *supra* note 23, at 2; U.S. EPA, PFAS STRATEGIC ROADMAP: EPA'S COMMITMENTS TO ACTION 2021–2024 at 17 (Oct. 2021) [hereinafter 2021–2024 STRATEGIC ROADMAP], https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf [https://perma.cc/XWB9-WXGD] (expressing sustained commitment to that unfulfilled plan); Brunswick, *supra* note 7, at 277 (explaining that designating PFAS as a "hazardous substance" was a goal under the 2019 Action Plan, but stalled during the first Trump Administration).

154. Nevitt & Percival, *supra* note 12, at 263; *See generally Proposed Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances*, *supra* note 55; 42 U.S.C. § 9601(14) (indicating where the PFOA and PFOS "hazardous substance" designation falls under CERCLA).

155. 42 U.S.C §§ 9601(33), 9601, 9607, 9611; Nevitt & Percival, *supra* note 12, at 262–66; Johnson, *supra* note 4, at 142 (explaining that strict liability and recuperating costs is not available for PFAS currently since PFAS are defined as "pollutants or contaminants").

attachment, covers the full costs of remedying the "hazardous substance" pollution.[156]

Disappointingly, this determination is not coupled with a "hazardous waste" classification under the Resource Conservation and Recovery Act (RCRA), which would enforce industry standards for handling PFAS waste.[157] Though EPA announced its proposed rule to designate nine PFAS as "hazardous constituents" under RCRA in February 2024,[158] this does not automatically deem those PFAS to be "hazardous waste" under RCRA or "hazardous substances" under CERCLA.[159] EPA itself admits in the notice of proposed rulemaking that "the scope of the proposal is limited"[160] as it only enjoins hazardous wastes treatment, storage, and disposal facilities in RCRA's Corrective Action Program.[161]

In addition to the SDWA NPDWR, the limited CERCLA designation, and the proposed RCRA designation, EPA revisited its CWA authority in April 2023, ordering Chemours's corrective action to address PFAS in stormwater and effluent discharges from one of its facilities.[162] This is notable not as a regulation but as a specific enforcement action indicating EPA is trying to make good on its liability promises.

Current EPA remediation rules are strongest and farthest-reaching under the SDWA because remediating PFAS in drinking water is paramount to public health. CERCLA designations seem promising because they "expose

156. EPA finds PRP who are "liable for contamination by matching wastes found at the site with parties that may have contributed wastes to the site." *Finding Potentially Responsible Parties (PRP)*, U.S. EPA, https://www.epa.gov/enforcement/finding-potentially-responsible-parties-prp [https://perma.cc/K4VF-3M72] (last updated May 1, 2024). The CERCLA strict liability standard is from "cradle-to-grave" once a PRP with a release or disposal is identified. This means that it includes the creation and use of the "hazardous substance" and its treatment, storage, or disposal. Tyra, *supra* note 38, at 212.

157. Nevitt & Percival, *supra* note 12, at 262–64.

158. Listing of Specific PFAS as Hazardous Constituents, 88 Fed. Reg. 8606 (proposed Feb. 8, 2024) (to be codified at 40 C.F.R. pts. 261, 271).

159. *Id.* at 8609–10; *Frequent Questions About Hazardous Waste Identification*, U.S. EPA, https://www.epa.gov/hw/frequent-questions-about-hazardous-waste-identification#difference [https://perma.cc/TA2T-FFF5] (last updated Feb. 1, 2024).

160. Listing of Specific PFAS as Hazardous Constituents, 88 Fed. Reg. at 8610.

161. *Id.*

162. Press Release, U.S. Env't Prot. Agency Press Off., EPA Takes First-Ever Fed. Clean Water Act Enf't Action to Address PFAS Discharges at Washington Works Facility near Parkersburg, W. Va., U.S. ENV'T PROT. AGENCY (Apr. 26, 2023), https://www.epa.gov/newsreleases/epa-takes-first-ever-federal-clean-water-act-enforcement-action-address-pfas [https://perma.cc/FEE6-W2MC].

manufacturers, suppliers and other alleged polluters to cleanup costs associated with contamination caused by PFAS, and additional regulatory costs."[163] Though CERCLA and RCRA both offer poignant, even potentially devastating, implications for PFAS manufacturers, which may also be potentially responsible parties, liability only attaches upon release or disposal. This limits 3M and DuPont's risks since, as the two key players, they have phased out their uses of PFOA and PFOS. They likely bypass significant liability, which, in turn, is largely pawned off to other entities subsequently using any contaminated materials and importantly, waste management facilities. Only including PFOA and PFOS effectively takes the punch out of this rule for 3M and DuPont. Furthermore, the RCRA requirements fall short of holding polluters accountable, as EPA states the designation merely establishes "the universe of chemicals of concern" to then later determine if the "hazardous constituents" should be considered for listing as "hazardous wastes."[164] This leaves public water systems as the main party enjoined under current EPA regulations. The impact anticipated from the 2016 TSCA amendment is not as sharp as hoped for. In September 2024, EPA issued a directed final rule delaying PFAS reporting until July 2025.[165] On the flip side, EPA proposed adding PFAS to the Toxic Release Inventory.[166] However, the Toxic Release Inventory, compared to Section 8(a) PFAS reporting, is public-facing under the Emergency Planning and Community Right-to-Know Act instead of data collection geared towards regulating. EPA explained that this delay on

163. William Roppolo et al., *How the PFAS Litigation Landscape is Expanding*, LEXISNEXIS LAW360 (Jan. 12, 2023), https://plus.lexis.com/api/permalink/02ed02da-6680-4658-a153-2110091e302c/?context=1530671 [https://perma.cc/6GCX-GRTL].

164. *Frequent Questions About Hazardous Waste Identification*, *supra* note 159.

165. The deadline is now January 11, 2026, for reporting under Section 8(a), which established EPA's duty to gather PFAS data from manufacturers dating back to 2011. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Data Reporting and Recordkeeping Under the Toxic Substances Control Act (TSCA); Change to Submission Period and Technical Correction, 89 Fed. Reg. 72336 (Sept. 5, 2024) (to be codified at 40 C.F.R. pt. 705).

166. Implementing Statutory Addition of Certain Per- and Polyfluoroalkyl Substances (PFAS) to the Toxics Release Inventory Beginning With Reporting Year 2024, 89 Fed. Reg. 43331 (May 17, 2024) (to be codified at 40 C.F.R. pt. 372) (eff. June 17, 2024).

PFAS reporting is due to serious budget restrictions and issues with software development.[167]

Slow and imbalanced regulations, which put onerous responsibility on public water systems amidst ongoing PFAS pollution, pushed the cost conundrum of mass PFAS water pollution to a breaking point.

F. Costs for Public Water Entities

EPA has committed to holding PFAS polluters accountable for remediation and prevention[168] because public water utilities and taxpayers "covering the cost of an industry that benefitted from PFAS is also not a form of justice."[169] Under the third prong of the Safe Drinking Water Act's (SDWA) 1996 Amendment cost-benefit requirement, issuing a PFAS National Primary Drinking Water Regulation (NPDWR) means the EPA administrator determined the benefits of imposing these regulations outweigh the costs.[170] Because "primary oversight of these [NPDWR] standards is delegated to the states,"[171] the states bear the costs. Cleanup costs for public water utilities include required treatment of PFAS-contaminated water, which includes filtration, removal, and then some form of storage and disposal. In this process, water systems can become releasers of hazardous substances and waste, but their costs, based on EPA guidance, will not include Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) strict liability.[172] The largest cost faced by all water systems is the treatment in accordance with the SDWA.

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167. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Data Reporting and Recordkeeping Under the Toxic Substances Control Act (TSCA); Change to Submission Period and Technical Correction, 89 Fed. Reg. at 72338, 70516; Sloane Masden Weber et al., *U.S. EPA Delays TSCA PFAS Reporting Deadline to January 2026*, FROST BROWN TODD LLP (Sept. 6, 2024), https://frostbrowntodd.com/u-s-epa-delays-tsca-pfas-reporting-deadline-to-january-2026 [https://perma.cc/G62R-NR9W].

168. *See generally* 2021–2024 STRATEGIC ROADMAP, *supra* note 153.

169. Johnson, *supra* note 39, at 134.

170. 42 U.S.C. § 300g-1(b)(1)(A)(iii).

171. Goss, *supra* note 8, at 574; 42 U.S.C. § 300g-2(a).

172. Memorandum from David M. Uhlmann, Assistant Admin. for Enf't and Compliance Assurance, PFAS Enforcement Discretion and Settlement Policy Under CERCLA 2 (Apr. 19, 2024) (on file with author), https://www.epa.gov/system/files/documents/2024-04/pfas-enforcement-discretion-settlement-policy-cercla.pdf [https://perma.cc/XR7P-MNJF].

EPA anticipates that about 66,000 public water systems will be subject to this PFAS rule.[173] EPA further expects that public water systems and primary state agencies will incur costs to monitor, report, and reduce PFAS levels in drinking water if needed to meet the NPDWR by treatment or nontreatment options.[174] The rule identifies the "best available technologies" as granular activated carbon filters, ion resin exchange, and high pressure membranes (reverse osmosis and nanofiltration).[175] Estimated total annual costs at a 3 percent discount rate are $777 million and at a 7 percent discount rate are $1.211 billion.[176] Even though EPA made clear in an April 2024 policy statement that public water utilities are protected from CERCLA enforcement discretion, in which it stated it intends not to pursue public water system liability due to equitable factors,[177] the designation still has serious cost implications for those state and local utilities. For example, there are concerns that public water systems may need to dispose of PFAS treatment residuals as hazardous waste, which will cost states an estimated extra $30 to $61 million per year.[178]

To help counteract high cost burdens on public water utilities and agencies, Congress passed the Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law).[179] This law invests $5 billion into new Emerging Contaminants in Small or Disadvantaged Communities (ED-SDC) grants and invests $4 billion into Drinking Water State Revolving Funds.[180] Congress intends for the unprecedented $9 billion to help states and tribal nations offset the cost burden of PFAS and other emerging contaminants in their public water systems.[181] However, even with this assistance, water utilities are still

173. U.S. EPA OFFICE OF WATER, *supra* note 149, at slide 29.

174. PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18690 (proposed Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142).

175. *Id.* at 18684.

176. *Id.* at 18700.

177. Uhlmann, *supra* note 172, at 3.

178. U.S. EPA OFFICE OF WATER, *supra* note 149, at slide 29; U.S. EPA, EPA Document No. EPA-822-P-23-001, ECONOMIC ANALYSIS FOR THE PROPOSED PER- AND POLYFLUOROALKYL SUBSTANCES NATIONAL PRIMARY DRINKING WATER REGULATION 7-10 (Mar. 2023), https://www.epa.gov/system/files/documents/2023-03/Proposed PFAS NPDWR EA_final_03_09_2023_0.pdf [https://perma.cc/7VSN-9PLF].

179. *Bipartisan Infrastructure Law*, U.S. EPA, https://www.epa.gov/infrastructure [https://perma.cc/6F29-X35U] (last updated Sep. 26, 2024).

180. FACT SHEET: EPA'S PROPOSAL TO LIMIT PFAS IN DRINKING WATER 3.

181. *Id.* at 2.

worried about the costs to improve treatment facilities to satisfy the SDWA standards and remediation costs.[182]

Numerous public utilities expect costs to be much higher than EPA's projection in its PFAS NPDWR.[183] Contrary to EPA's cost assessments, states are estimating that for all public water systems in the United States to comply with the proposed maximum contaminant levels, for PFOA and PFOS alone, it would cost about $47.3 billion.[184] Recent research from the American Water Works Association calculates small system compliance regarding PFOA and PFOS alone to exceed $21.6 billion, compared to EPA's $1.1 to $2.5 billion estimate.[185] The same research estimated NPDWR compliance costs for PFOA and PFOS, excluding "systems already triggered into treatment" with existing state water regulations, at just under $50 billion.[186] The same research compared this to annualized costs at around $3.3 billion.[187] Another estimate from Praedicat, a liability and emerging risk analytics company, anticipates PFAS cleanup *alone* will exceed $400 billion.[188] Even if costs do not reach these heights, under EPA's estimates, just five years of compliance could cost between $150 and $305 million for CERCLA requirements and between $3.885 and $6.055 billion for SDWA requirements. Added together, EPA anticipates costs ranging from $4.035 to $6.360 billion over five years.

There are two key issues with the government's approach to mitigating costs. First, public water systems are rightfully

182. Tyra, *supra* note 38, at 190–91.

183. Ben Casselman et al., *Three 'Forever Chemicals' Makers Settle Public Water Lawsuits*, N.Y. TIMES, https://www.nytimes.com/2023/06/02/business/pfas-pollution-settlement.html [https://perma.cc/Y3VK-3N5L] (last updated June 22, 2023).

184. Amicus Letter at 3, In re Aqueous Film-Forming Foams Prods. Liab. Litig. MDL No. 2-18-mn-2873-RMG, relating to City of Camden et al. v. DuPont, No. 2:23-cv-03230-RMG (D.S.C. Aug. 7, 2023), https://oag.ca.gov/system/files/attachments/press-docs/Amicus%20Letter.pdf [https://perma.cc/F59B-TTES].

185. The estimates come from Black & Veatch in 2023, using occurrence data collected by Corona Environmental in 2021. Am. Water Works Ass'n, Comments on the Proposed "PFAS National Primary Drinking Water Regulation Rulemaking" 41 (May 30, 2023), https://www.awwa.org/wp-content/uploads/AWWA-Comments-on-Proposed-NPDWR-for-PFAS-excl-AppendixE.pdf [https://perma.cc/T6GH-FPCP].

186. The estimates are based on four parts per trillion. *Id.* at app. B, WITAF 56 Technical Memorandum Update: PFAS National Cost Model Report 31.

187. Annualized costs include annual operating costs and were calculated based on a 3 percent discount rate. *Id.* at app. B, WITAF 56 Technical Memorandum Update: PFAS National Cost Model Report 32.

188. Russ Banham, *The Next Asbestos*, LEADER'S EDGE (Jan. 17, 2023), https://www.leadersedge.com/p-c/the-next-asbestos [https://perma.cc/QH4Q-AQUT].

frustrated that they are now in charge of fixing PFAS pollution perpetrated wrongfully by DuPont and 3M. These costs should not have fallen to water utilities in the first place—utilities who have already been assuming independent action on a case-by-case basis given the lack of federal standards. Additionally, this means U.S. residents, who have already paid with their own PFAS poisoning, now have their tax dollars allocated to fixing PFAS pollution, leaving less revenue for other objectives. Second, the mitigating efforts pale in comparison to the actual cost of remediation. The extent of PFAS pollution likely demands years of remediation and prevention measures, meaning costs may fluctuate unpredictably and even increase over time. Short-chain PFAS pollution, which was once promoted as a safe alternative, also enables reasonable predictions that remediation could be never-ending. An inconsequential amount in comparison with what is required helps no one. Disappointingly, the financial burden on local, state, and tribal governments ultimately falls on taxpayers, whose tax dollars are also implicated in the federal grants. If federal regulations cannot protect sovereigns and residents, public entities must fend for themselves.

II. STATE INTERVENTION: HOLDING DUPONT AND 3M ACCOUNTABLE

Slow EPA regulation offers sovereigns no legal avenue to impose liability on or sue polluting companies under *federal* law. Without proper regulatory "floors," remediation is largely relegated to various state approaches. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) PFOA and PFOS causes of action do little to remedy this because DuPont and 3M have long since phased out and replaced those PFAS with short-chain PFAS, primarily GenX and PFBS.[189] Importantly, in 2019, 602 PFAS out of the 1,223 on the Toxic Substances Control Act's (TSCA) Chemical Substance Inventory, about 49 percent, "were still commercially active."[190] All of these PFAS except PFOA and PFOS remain unactionable under CERCLA because they have not been designated as "hazardous substances." Only classifying the two PFAS that have been phased out of production effectively

189. *Fact Sheet: 2010/2015 PFOA Stewardship Program*, *supra* note 18.
190. Goss, *supra* note 8, at 577.

operates as an EPA shield for polluting companies from CERCLA strict liability to remediate and pay for their ongoing hazardous pollution. Because of EPA's broken promises, lawsuits are filed under state common law and statutory claims.[191] This further exacerbates the patchwork approach to a national conundrum, placing high costs on states and victims of pollution.

Beyond the EPA liability shield, polluting companies actively skirt admissions of guilt and financial liability. Class actions, ending almost exclusively in settlement, have allowed DuPont and 3M to widely avoid findings of fault.[192] Increasing the hurdles to imposing remediation and its costs on polluters, DuPont limited its financial liability by transferring its Performance Chemicals business, which housed its PFAS products, to its wholly owned subsidiary, Chemours.[193] It then spun off Chemours as a separate entity in 2015, just three years after the Unregulated Contaminant Monitoring Rule 3 included four short-chain PFAS in addition to PFOA and PFOS.[194] Because adding short-chain PFAS signaled that the problems of PFAS pollution and remediation were going to get worse before they got better, Chemours "took on DuPont's environmental liabilities."[195]

DuPont orchestrated the spin-off two years before reaching a final settlement in the Ohio C-8 multidistrict litigation (MDL) 2433[196] in which it estimated its maximum financial liability at $128 million.[197] However, the 2017 settlement was $671 million,

191. Johnson, *supra* note 39, at 110.

192. Brunswick, *supra* note 7, at 290.

193. Complaint for Civil Penalties, Abatement, Equitable Relief, and Damages at 46–47, California v. 3M, No. 4:22-cv-09001-HSG (N.D. Cal. filed Nov. 11, 2022) [hereinafter California v. 3M Complaint], https://oag.ca.gov/system/files/attachments/press-docs/11.10.22%20PFAS%20Complaint.Final_.pdf [https://perma.cc/XNQ3-9CT2].

194. *Id.*; Brunswick, *supra* note 7, at 290. The Chemours Separation Agreement also included broad indemnity provisions for Chemours against DuPont. California v. 3M Complaint, *supra* note 193, at 50.

195. Ray, *supra* note 14, at 87; David Gelles & Emily Steel, *How Chemical Companies Avoid Paying for Pollution*, N.Y. TIMES (Oct. 20, 2021), https://www.nytimes.com/2021/10/20/business/chemours-dupont-pfas-genx-chemicals.html [https://perma.cc/U2J8-C43K].

196. *DuPont C8 Lawsuit*, LEVIN PAPANTONIO RAFFERTY, https://levinlaw.com/dupont-c8-litigation [https://perma.cc/3U39-6TJG]; Randall Chaseap, *Court Upholds Dismissal of Chemours Lawsuit Against DuPont*, AP NEWS (Dec. 16, 2020), https://apnews.com/article/lawsuits-delaware-environment-courts-us-news-9c2ba2777ab8f5db3d40aa4f0ae8711c [https://perma.cc/XNV7-4HT4].

197. Chaseap, *supra* note 196.

over five times its estimate, of which Chemours paid half.[198] In January 2021, DuPont, Chemours, and Corteva[199] stipulated their future PFAS liability.[200] Chemours will pay 50 percent, leaving DuPont and Corteva to each take on 25 percent of the remaining half.[201] The memorandum also created a $4 billion cap on the share of future expenses and a $1 billion escrow fund which will replenish the cap once if, in settlements, the cap fund falls below $700 million before 2029.[202] Though the cap is just for DuPont, Chemours, and Corteva, $4 to $5 billion looks like a small share of compensation, considering about $54 billion was spent on asbestos litigation,[203] and that is similar to PFAS remediation estimates for PFOA and PFOS alone from states and the American Water Works Association.

The key question remains: How can liability best be asserted on polluting companies to pay for PFAS remediation, fixing the problem they knowingly hid?

This Part will develop the conundrum public water systems, states, and even U.S. territories face in attempting to assert liability for PFAS pollution on industry actors following absent or, at best, untimely and ill-suited EPA regulation. First, it addresses PFAS litigation, primarily brought by states, and the constant reality of settlements, resulting in fragmented, insufficient resolutions. Next, it focuses on MDL 2873, synthesizing the claims, remedies sought, and the settlement effects on public water systems. In evaluating PFAS litigation by public entities, this Part establishes that patchwork regulations requiring litigation for their financial feasibility fail to properly address PFAS pollution. Lastly, this Part acknowledges that MDLs are not a true solution to the policy conundrum at hand, and it reframes how EPA can better use its TSCA authority to limit the need for over-reliance on lawsuits.

198. *Id.* Chemours attempted to sue DuPont alleging it intentionally downplayed the projected financial liabilities, but the suit was dismissed in 2020. *Id.*

199. Corteva is a company which split from DuPont in 2019, alongside Dow, Inc. Ray, *supra* note 14, at 87.

200. Memorandum of Understanding from the Chemours, DuPont Indemnitees, and Corteva Settlement at 7 (Jan. 22, 2021) [hereinafter Memorandum of Understanding] (on file with author).

201. *Id.*; Ray, *supra* note 14, at 87.

202. Memorandum of Understanding, *supra* note 200; Ray, *supra* note 14, at 87.

203. Ray, *supra* note 14, at 88.

A. The Need for PFAS Litigation

Initial PFAS litigation arose from private plaintiffs suffering devasting harm caused by PFAS pollution nearby offending institutions.[204] These lawsuits, often class actions or multidistrict litigation (MDL), which preserve original actions to be remanded back to their originating jurisdictions, have continued to grow in number. Even rural water utilities formed a class action seeking injunctive relief for PFAS testing and data collection.[205] Many public entities, particularly state attorneys general and sovereigns, have joined legal action.[206] These public entities are "suing for remediation costs associated with the polluted water sources in the states where they are located."[207]

In 2010, Minnesota became the first state to sue 3M, seeking to recover costs for environmental PFAS cleanup and alleging 3M's manufacturing contaminated groundwater and, ultimately, resident drinking water.[208] Minnesota sued under its own version of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Minnesota Environmental Response & Liability Act.[209] Minnesota sought $5 billion in damages and settled in 2018 for $850 million, $130 million of which went to litigation expenses.[210] After Minnesota set an example for state action, others followed suit.

Currently, California's 2022 lawsuit demonstrates states' concerns by stating that "[t]o address PFAS contamination in California, extensive and expensive treatment and remediation

204. *See generally* HARVARD LAW & INTERNATIONAL DEVELOPMENT SOCIETY, *supra* note 50.

205. Liljestrand, *supra* note 7, at 23.

206. PFAS Primer Team, *More State AG Suits Against PFAS Manufacturers*, ALSTON & BIRD LLP (May 26, 2023), https://alstonpfas.com/more-state-ag-suits-against-pfas-manufacturers [https://perma.cc/T9TA-R3NV]; Press Statement, *More Than Half of US State Attorneys General Have Taken Action Against PFAS Manufacturers and Key Users*, SAFER STATES (Aug. 24, 2023), https://www.saferstates.org/press-room/more-than-half-of-us-state-attorneys-general-have-taken-action-against-pfas-manufacturers-and-key-users [https://perma.cc/3ARG-C5DQ].

207. Roppolo, *supra* note 163.

208. Tyra, *supra* note 38, at 189; Brunswick, *supra* note 7, at 290.

209. Minn. Stat. ch. 115B Environmental Response and Liability, MINN, STAT. ANN. § 115B (West 2019); Johnson, *supra* note 39, at 120.

210. Brunswick, *supra* note 7, at 292; Settlement, Minn. v. 3M Co., No.-27-CV-10-28862, 2010 WL 5395085 (D. Minn. Dec. 30, 2010); *Minnesota 3M PFAS Settlement*, MINN. POLLUTION CONTROL AGENCY & MINN. DEP'T OF NAT. RES., https://3msettlement.state.mn.us [https://perma.cc/534T-ZVV5].

of PFAS will be required."[211] The state cites costs for treatment, which include acquisition, set up, operation, and maintenance costs.[212] Additionally, costs extend to testing, medical monitoring, public notice, replacement water, administrative costs, and safe disposal or destruction costs.[213] California also alleges that DuPont's restructuring ultimately resulted in decreasing its tangible assets by $20.85 billion to evade financial liabilities.[214] As of August 2023, more than half the U.S. attorneys general have filed lawsuits against PFAS polluting entities.[215] Out of twenty-seven states, including Minnesota, only four have reached settlements.[216] In addition to common law and state statutory claims, sovereigns also file PFAS lawsuits as trustees of their states' natural resources (under the Public Trust Doctrine), in their parens patriae capacity, and any other authorities and powers to protect public health and the environment in their states or territories.[217]

Interestingly, action on behalf of constituents is not limited to litigation in seeking liability costs. Senator Kirsten Gillibrand reintroduced the PFAS Accountability Act on February 1, 2024.[218] This act would establish a Toxic Substances Control Act (TSCA) cause of action for people who suffered significant PFAS exposure from manufacturers.[219] Furthermore, it would better enable courts to award medical monitoring costs and incentivizes responsible industries to fund PFAS safety research.[220] Medical monitoring helps identify and treat PFAS-caused conditions and critically builds research

211. California v. 3M Complaint, *supra* note 193, at 43.
212. *Id.* at 45.
213. *Id.*
214. *Id.* at 47.
215. *More Than Half of US State Attorneys General Have Taken Action Against PFAS Manufacturers and Key Users*, *supra* note 206.
216. *Id.*
217. Memorandum of Law in Support of The Sovereigns' Motion to Intervene, supra note 1, at 1.
218. PFAS Accountability Act of 2024, S. 3725, 118th Cong. (as reintroduced Feb. 1, 2024).
219. Significant exposure is proven by demonstrating one was present in an area where PFAS were being released for at least one year. Press Release, Kirsten Gillibrand U.S. Sen. for N.Y., Gillibrand Announces Legislation to Help Victims of Significant PFAS Contamination to Sue Manufacturers (Feb. 1, 2024), https://www.gillibrand.senate.gov/news/press/release/gillibrand-announces-legislation-to-help-victims-of-significant-pfas-contamination-to-sue-manufacturers [https://perma.cc/XU63-ZBQK]. Individuals may otherwise get blood testing to demonstrate significant PFAS exposure. *Id.*
220. *Id.*

showing these causal connections.[221] The last goal is to "incentivize the industry to fund PFAS safety research."[222] Reintroducing the PFAS Accountability Act with a research focus affirms the likelihood that resolving PFAS pollution and remedying its effects lies decades in the future. Additionally, it indicates that remediation costs for water are one piece of the puzzle alongside medical care and research funding, which are also incredibly expensive. However, because the PFAS Accountability Act does not help public plaintiffs like states and local water utilities, it does not operate as even a partial regulatory solution to PFAS remediation costs for public water systems.

B. MDL 2873: The 3M Settlement

Multidistrict litigation (MDL) 2873, consolidated in 2018, is the first major national PFAS lawsuit, arising from numerous cases seeking remediation and damages for aqueous film-forming foam (AFFF) groundwater contamination.[223] In consolidating all the cases, the court also denied 3M's motion to broaden the litigation to include all cases relating to 3M's use and handling of PFAS.[224] The MDL is thus incredibly broad but may not encompass all possible PFAS actions against industry actors. In December 2024, a little over 7,000 cases remained in the MDL following the 3M global settlement regarding water contamination.[225] In July 2023, a $10.5 to $12.5 billion proposed settlement was announced regarding 3M's related cases in MDL 2873.[226] The 3M settlement is alongside DuPont's

221. *C-8 Medical Monitoring Program*, http://www.c-8medicalmonitoringprogram.com [https://perma.cc/DHS2-9XK9].

222. Press Release, Kirsten Gillibrand U.S. Sen. for N.Y., *supra* note 219.

223. DiGiannantonio, *supra* note 51.

224. *See* In re Aqueous Film-Forming Foams Prods. Liab. Litig., 357 F. Supp. 3d 1391, 1396 (J.P.M.L. 2018).

225. Ronald V. Miller, Jr., *AFFF Firefighting Foam Lawsuit*, LAWSUIT INFO. CTR., https://www.lawsuit-information-center.com/afff-firefighting-foam-lawsuit.html [https://perma.cc/2677-UXCA] (last updated Oct. 7, 2024).

226. Settlement Agreement Between Public Water Systems and 3M Company at 11, In re Aqueous Film-Forming Foams Prods. Liab. Litig., MDL No. 2:18-mn-2873-RMG, relating to City of Camden v. 3M Co., No. 2:23-cv-03147-RMG (D.S.C. July 3, 2023) (ECF No. 10-3).

$1.185 billion settlement, which was finalized after a final fairness hearing in December 2023.[227]

3M's settlement seeks to address and resolve "Public Water Systems' Claims regarding alleged PFAS-related harm to Drinking Water and associated financial burdens, including Public Water Systems' potential costs of monitoring, treating, or remediating PFAS in Drinking Water."[228] It defined the settlement class as "every active public water system in the United States" that "has one or more impacted water sources" or, even without having an impacted water source at the time of the settlement, "is required to test for certain PFAS under UCMR 5, or served more than 3,300 people, according to [the Safe Drinking Water Information System]."[229] Though the class excludes water systems wholly owned by state governments,[230] states are still impacted under every other included public water system they have. This is especially concerning considering the UCMR 5 listed the PFAS class as a whole, providing the most comprehensive PFAS monitoring requirements to date.[231] Water utilities included in the class must agree to release terms, a covenant not to sue, and a dismissal in the case.[232]

Later in July, over twenty sovereigns filed a motion to intervene, desperately protecting their other twenty-three pending PFAS lawsuits and any future claims.[233] The sovereigns put forth three critical points of contention with the settlement terms, which demonstrate key considerations for PFAS remediation cost claims.[234] First, they declared the ambiguous and expansive release terms may preclude their

227. John Gardella, *PFAS AFFF MDL Settlements Moving Forward*, NAT. L. REV. (Aug. 31, 2023), https://www.natlawreview.com/article/pfas-afff-mdl-settlements-moving-forward [https://perma.cc/2GLX-SU7F].

228. Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 226, at 1.

229. *Id.* at 14 (capitalization omitted). SDWIS stands for "Safe Drinking Water Information System," which serves as EPA's "Fed Data Warehouse." *Safe Drinking Water Information System (SDWIS) Federal Reporting Services*, U.S. EPA, https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information-system-sdwis-federal-reporting [https://perma.cc/XA25-DMBC] (last updated Mar. 14, 2024).

230. Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 226, at 14.

231. *Id.*

232. *Id.* at 11.

233. *See generally* Memorandum of Law in Support of The Sovereigns' Motion to Intervene, *supra* note 1.

234. *Id.* at 21–22.

claims *even if* they opt out of the settlement.[235] Second, they argued the indemnity provisions were overbroad and could "shift billions of dollars of 3M's liability onto class members . . . ultimately, the [sovereigns'] taxpayers."[236] Third, the sovereigns worried the preliminary settlement approval may impose an anti-suit injunction, presumably staying all other cases and damages for testing and treatment of involved public water systems.[237] In August 2023, the U.S. District Court for the District of South Carolina preliminarily approved an amended proposed settlement addressing these concerns, which was then confirmed following a final hearing on February 2, 2024.[238]

The new settlement has three major changes. First, it includes "claim-over" provisions protecting state attorney general lawsuits not eligible for the settlement and gives parties ninety days to opt out instead of the original sixty.[239] It also wholly removed the contested indemnity provisions which released parties from "any future or further exposure or payment arising out of, related to, or involving the released claims."[240] The settlement still allows public water systems to seek subsequent damages for PFAS contamination in other property or facilities owned or operated by the class member so long as it is not related to drinking water.[241] For example, a public water utility could seek other damages for PFAS contamination affecting separate water systems, like stormwater systems. Finally, the settlement no longer releases

235. *Id.*
236. *Id.*
237. *Id.*
238. rder and Opinion, In re Aqueous Film-Forming Foams Prods. Liab. Litig., MDL No. 2:18-mn-2873-RMG, relating to City of Camden v. 3M Co., No. 2:23-v-3147-RMG (D.S.C. Mar. 29, 2024); Gardella, *supra* note 227.
239. Amended Settlement Agreement Between Public Water Systems and 3M Company at 28, 40, In re Aqueous Film-Forming Foams Prods. Liab. Litig., MDL No. 2:18-mn-2873-RMG, relating to City of Camden v. 3M Co., No. 2:23-cv-03147-RMG (D.S.C. Aug. 28, 2023). The ninety-day timeline ended March 15, 2024. *Public Water System Settlements*, PFAS WATER SETTLEMENT, https://www.pfaswatersettlement.com [https://perma.cc/2F4N-CZKE].
240. *Compare* Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 226, at 40, *with* Amended Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 239, at 41.
241. *The 3M PFAS Water Provider Settlement: What You Need to Know,* 10, https://afff-mdl.com/wp-content/uploads/2023.11.01-3M-White-Paper.pdf [https://perma.cc/WZK9-GT3J]; *3M Webinar & Disclaimer*, AQUEOUS FILM-FORMING FOAMS (AFFF) MDL (Sept. 7, 2023), https://afff-mdl.com/3m-webinar-disclaimer [https://perma.cc/A6C6-AXFN].

claims owned by state governments,[242] which, coupled with claim-over protections, arguably mitigates the anti-suit injunction threat.

The claim-over protections may have secured the option for non-releasing parties' ongoing or future claims, but that option was likely unattainable for meaningful and timely remediation. There are two key risks for public water systems who opt out. First is the timeline. The Honorable Richard M. Gergel noted that he is years away from remanding cases back to their originating district court.[243] Once back, those judges will need to familiarize themselves before continuing litigation. Water utilities may not receive any relief before drinking water requirements are legally enforceable. Next is bankruptcy. 3M's financial capacity is large, but in order to satisfy the existing settlement, payouts are staggered to allow for 3M revenue in the meantime.[244] If 3M files for bankruptcy, ongoing and future claims for relief may never be satisfied. Public water systems faced high pressure to remain in the settlement as their last avenue for 3M's financial liability to water utilities.

Though the amended settlement sincerely aims to help public water systems, the release provisions for applicable parties are still broad.[245] They bar litigation claims for "any type of relief," for any "treatment, filtration, remediation, management, investigation, testing, or monitoring of PFAS in Drinking Water," and for increased drinking water utility rates

242. Amended Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 239, at 43.

243. *3M Water Provider Settlement Deck Final*, AFFF MDL NO. 2873 LEADERSHIP 17 (Sept. 7, 2023), https://afff-mdl.com/wp-content/uploads/3M-Settlement-Deck-Final.pdf [https://perma.cc/2HZH-ZHDA].

244. *See id.* at 12 (showing payout percentages over time for both phases).

245. Under the Amended Settlement Agreement, released parties means "3M and its respective past, present, or future administrators, advisors, affiliated business entities, affiliates, agents, assigns, attorneys, constituent corporation or entity (including constituent of a constituent) absorbed by 3M in a consolidation or merger, counsel, directors, divisions, employee benefit plans, employee benefit plan participants or beneficiaries, employees, executors, heirs, insurers, managers, members, officers, owners, parents, partners, partnerships, predecessors, principals, resulting corporation or entity, servants, shareholders, subrogees, subsidiaries, successors, trustees, trusts, and any other representatives, individually or in their corporate or personal capacity, and anyone acting on their behalf, including in a representative or derivative capacity. It is the intention of this Agreement that the definition of 'Released Parties' be as broad, expansive, and inclusive as possible." Amended Settlement Agreement Between Public Water Systems and 3M Company, *supra* note 239, at 9.

due to those costs.[246] This means that local and state water utilities who did not opt out have no avenue for any further future compensation from 3M relating to drinking water, even if costs far exceed payouts made under the settlement. Without other viable avenues, public water systems must then rely on settlement money from other defendants, funds like the Bipartisan Infrastructure Act, and taxpayer dollars for increased drinking water rates. The question of whether the combined settlement amount will sufficiently cover public water systems' costs remains unclear.

C. What Do Sovereigns Want?

Overall, the total cost of PFAS pollution remediation in the United States will be ongoing. The costs will almost surely exceed 3M's proposed settlement amount.[247] Public water systems bearing these costs under the new 2024 PFAS National Primary Drinking Water Regulation (NPDWR) financially chains them and taxpayers alike to be "responsible for contamination they did not create," forcing them to front the bill when "PFAS manufacturers should be the responsible party."[248] Intervening states want to protect their interests in holding 3M and DuPont accountable and financially liable for resolving the damage done to natural resources.

Turning to remedies sought in specific state attorney general complaints against 3M and DuPont, states seek court action abating the PFAS nuisance, enforcing equitable relief, imposing costs, awarding damages, and addressing DuPont's fraudulent transfer scheme to obtain a constructive trust.[249] For example, the State of Washington seeks to impose liability for all prior and impending costs to "investigate, mitigate, remediate, restore, treat, monitor, and otherwise respond to

246. *Id.* at 35.

247. *See* American Water Works Association, *supra* note 185; PFAS National Primary Drinking Water Regulation Rulemaking, 88 Fed. Reg. 18638, 18700 (Mar. 29, 2023) (to be codified at 40 C.F.R. pts. 141–142); Banham, *supra* note 188.

248. Tyra, *supra* note 38, at 214.

249. California v. 3M Complaint, *supra* note 193, at 77–78; Complaint for Damages at 63–65, Washington v. 3M Co., No. 23-2-09821-8 SEA (King Cnty. Super. Ct. May 30, 2023) [hereinafter Washington v. 3M Complaint]; Complaint at 107, Pennsylvania v. EIDP, Inc., No. 1:2023cv01131 (M.D. Pa. July 6, 2023) [hereinafter Pennsylvania v. EIDP Complaint] (filed May 30, 2023) (removed to federal court July 6, 2023, with original filing on May 30, 2023) (naming only DuPont entities as defendants, focusing on DuPont's fraudulent transfer scheme).

PFAS contamination resulting from Manufacturer Defendants' AFFF Products."[250] States are seeking reimbursement for action to investigate and respond to the PFAS public nuisance, in addition to future remediation costs.[251] Part of these cost demands encompass abatement funds to "investigate, remove, treat, remediate, clean up and otherwise mitigate PFAS contamination."[252] Financial remedies are balanced with equitable relief to protect against future pollution.[253]

States also advocate for courts to void the Chemours and DuPont transfers at least to the extent necessary to satisfy their claims.[254] Then, states also ask the court to enjoin all DuPont parties from disposing of the property, assets, or their proceeds in any way.[255] This is to recover the property and value "lost" in DuPont's allegedly fraudulent transfer scheme. States seek to protect these funds in a constructive trust to be held for that state's benefit.[256] States have long understood the obstacles in obtaining proper relief regarding PFAS contamination and are requesting courts not only order 3M and DuPont to remediate the results of their polluting actions but also put an end to the DuPont entities' weaseling around financial liabilities.

III. DEMANDING CORPORATE RESPONSIBILITY: HOW TO PROPERLY REMEDIATE PFAS COMPLIANCE FAILURES

A nationwide problem cannot have a successful solution based in state-by-state action.[257] Because EPA's strongest rule is under the Safe Drinking Water Act (SDWA), which puts the costs on public water systems, litigation is still required to hold polluting manufacturers liable. Sovereign litigation efforts have been somewhat successful, but states and water utilities are rightly concerned about affording compliance with high remediation costs. The cost of PFAS has been enormous for the

250. Washington v. 3M Complaint, *supra* note 249, at 63.
251. *Id.* at 44–45, 78.
252. California v. 3M Complaint, *supra* note 193, at 77.
253. *Id.*
254. *Id.* at 78; Washington v. 3M Complaint, *supra* note 249, at 64–65; Pennsylvania v. EIDP Complaint, *supra* note 249, at 107.
255. California v. 3M Complaint, *supra* note 193, at 78; Washington v. 3M Complaint, *supra* note 249, at 64–65; Pennsylvania v. EIDP Complaint, *supra* note 249, at 107.
[255] California v. 3M Complaint, *supra* note 193, at 78; Washington v. 3M Complaint, *supra* note 249, at 65; Pennsylvania v. EIDP Complaint, *supra* note 249, at 107.
257. Johnson, *supra* note 39, at 111.

American people already. EPA and the multidistrict litigation (MDL) court must make clear to the American people that protecting them is more important than protecting DuPont and 3M. This Comment offers regulatory solutions to prioritize protecting sovereigns and taxpayers first in handling the costs of PFAS remediation.

To begin, Part III analyzes the MDL, addressing its wins. Importantly, this Section does not put forth a solution grounded in MDL litigation. Part III steers solutions towards EPA authority under the Toxic Substances Control Act (TSCA) in an attempt to set forth a framework for EPA to better achieve TSCA's goals and prevent mass contamination like the PFAS conundrum. In responding to counterarguments and advocating for EPA action, Part III hopes to help us move forward after looking back over the history of mass PFAS contamination in waters. There must first be sufficient compensation for remediation. Then, ideally, better enabling EPA authority under TSCA is the best solution to prevent ongoing pollution conundrums and the high cost of litigation.

A. The Multidistrict Litigation (MDL) Court and Next Steps

When federal guidance is slow and enforcement absent, states have taken on their own PFAS remediation regulations and lawsuits to enforce 3M's and DuPont's financial liability for those costs. Without sufficient state funds to fully address PFAS and the federal SDWA National Primary Drinking Water Regulation (NPDWR), "utilities will have to recover costs through litigation against PFAS manufacturers or users."[258] Additionally, because of the damaging unethical information uncovered in the initial lawsuits, "many of these utilities and municipalities choose to file lawsuits and hold the polluters accountable, rather than pursue government funding from tax dollars."[259] Exacerbated by EPA's insufficient financial liability actions, scrambling for a way to pay is different than ensuring 3M and DuPont honor their respective financial responsibilities.

Proper financial responsibilities are clearly disputed. While this Comment focuses on DuPont and 3M as the initial and major manufacturers, many other entities have large roles in

258. Tyra, *supra* note 38, at 204.
259. DiGiannantonio, *supra* note 51.

PFAS use and pollution. Some may argue that DuPont and 3M did not know enough about PFAS toxicity, or that clear EPA guidance did not exist to help them do any better. Such proponents may further assert that DuPont and 3M willingly partook in the PFOA phase-out and paid fines, honoring their liability sufficiently. This was an attractive argument until the grave disparity between what DuPont and 3M knew, versus what was public, became exposed.

Discovery in *Tennant* revealed DuPont and 3M knew the dangers of PFAS contamination by 1976.[260] Rob Bilott's letter to EPA explained how discovery revealed that both DuPont and 3M were working together since at least the 1970s to research toxic and even cancer-causing effects of PFOS and PFOA, and that they both knew of such adverse results by the 1980s.[261] DuPont even went so far as to draft its own safety standards and research alternatives but kept using PFAS and by 1994 "adopted a corporate plan to start routinely dumping C-8 wastes into the Dry Run Landfill."[262] The Dry Run Landfill is where PFAS seeped into groundwater from disposal of PFAS-contaminated sludge, which DuPont certified as non-hazardous under the Resource Conservation and Recovery Act (RCRA).[263] Instead of remediating PFAS in the drinking water supply, DuPont bought the well property and moved the wells two miles farther from the plant.[264] These actions were concurrent with DuPont and 3M's PFAS testing on monkeys in the 1990s, which confirmed adverse health effects at any exposure level.[265] 3M eventually notified EPA in 1999 per the Toxic Substances Control Act (TSCA), Section 8(e), which also spurred EPA demands to 3M and DuPont for more information of their uses and releases of PFAS chemicals.[266] Altogether, ultimately, between the 1960s and 1990s, industry insiders kept their discoveries hidden and by the 1980s, DuPont and 3M began publicly denying PFAS exposure and risks.[267]

260. Gaber et al., *supra* note 47, at 2.

261. Letter from Robert A. Bilott, Taft, Stetinius & Hollister LLP, to Christine T. Whitman, Adm'r, U.S. EPA, et al., 5 (Mar. 6, 2001), https://www.hpcbd.com/wp-content/uploads/migrations/2061991/dupont/Dupont-C8-Violations-Reported-to-EPA.pdf [https://perma.cc/28JV-Q6RT].

262. *Id.* at 5, 9.

263. *Id.* at 7.

264. *Id.*

265. *Id.* at 5–6.

266. *Id.* at 6.

267. Gaber et al., *supra* note 47, at 10.

Though the MDL settlement is praised as the largest PFAS settlement to date and is intended to enable public water system compliance with new PFAS drinking water standards, 3M is still getting a good deal. While some, including the MDL judge, are wary of bankruptcy ($12.5 billion is only about 22 percent of 3M's current market capitalization), 3M is the *largest* market participant in aqueous film-forming foam (AFFF) and PFAS, accounting for 70 to 80 percent of the market share.[268] Even if 3M or DuPont were at risk of bankruptcy or dissolution, this Comment posits that if an entity depends on dangerous uses of toxic chemicals, it should ideally cease to exist anyways. In recognizing the vast disparity between the past and proposed financial liability, and the much larger scope of PFAS contamination fault and associated remediation costs, the MDL's limits regarding remediation are an unavoidable reality.

The MDL 2873 court balanced its demands relatively well and made a clear effort to enforce a settlement which provides substantial compensation. It rightfully protected other avenues for drinking water costs related to PFAS contamination. While the MDL court made progress and lawsuits are far from over, the real solution regarding litigation is avoiding it as a means to compensation for remediation.

B. EPA Rulemaking and Enforcement Power

Since EPA's initial lawsuits against 3M and DuPont, the agency has imposed essentially no other financial liability. While prioritizing drinking water remains paramount, EPA should have better protected public water systems by consistently enforcing costs on 3M and DuPont. EPA should use its authority to more aggressively demand compliance from industry actors who have numerous incentives to skirt accountability.

The EPA Office of Enforcement and Compliance Assurance (OECA) added "addressing exposure to PFAS" to its National Enforcement and Compliance Initiatives for fiscal years 2024 through 2027 (hereinafter FY 2024–2027 NECIs).[269] The

268. 3M WEBINAR & DISCLAIMER, *supra* note 241, at 06:45, 07:00, 19:30.

269. Memorandum from David M. Uhlmann, Assistant Adm'r, U.S. EPA, on FY 2024–2027 Nat'l Enf't and Compliance Initiatives 1 (Aug. 17, 2023) (on file with U.S. EPA), https://www.epa.gov/system/files/documents/2023-08/fy2024-27necis.pdf [https://perma.cc/7AZ4-JT35]; *see* Public Comment on EPA's National

primary goals include using EPA authority to identify and characterize PFAS contamination sites, control releases, and ensure compliance.[270] To achieve these goals, the memorandum discusses EPA's planned approach to its PFOA and PFOS Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) designations.[271] EPA asserts it will focus liability on PFAS manufacturers and users, federal facilities, and other industrial parties liable for their significant contributions to the release of PFAS into the environment.[272] Doubling down, the OECA expressly plans to use its CERCLA enforcement discretion to *not* pursue water utility entities because equitable factors weigh against CERCLA liability in these situations.[273]

In the spirit of these goals, EPA should be given the means to successfully carry out its statutory charge under the Toxic Substances Control Act (TSCA) too. Though Section 8(a)(7) of TSCA pertains to PFAS reporting, EPA issued a direct rule delaying such industry reporting until July 11, 2025.[274] Section 8(a)(7) requires EPA to collect electronic reporting from manufacturers regarding any PFAS manufactured or imported by that entity in any year since January 2011.[275] EPA had to delay such reporting, which will serve as an aggressive basis for ongoing PFAS rulemaking in accordance with the FY 2024–2027 NECIs, due to budget cuts and ongoing software development for EPA's Central Data Exchange system.[276] EPA explains in the rule text that "increased statutory obligations across the TSCA Existing and New Chemicals programs and a lack of

Enforcement and Compliance Initiatives for Fiscal Years 2024–2027, 88 Fed. Reg. 2093 (Jan. 11, 2023).

270. Namely, EPA will use its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), and the Safe Drinking Water Act (SWDA). Memorandum from David M. Uhlmann, *supra* note 269, at 3.

271. *Id.*

272. *Id.* at 4.

273. *Id.* at 3.

274. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Data Reporting and Recordkeeping Under the Toxic Substances Control Act (TSCA); Change to Submission Period and Technical Correction, 89 Fed. Reg. 72336 (Sept. 5, 2024) (to be codified at 40 C.F.R. pt. 705).

275. 15 U.S.C. § 2607(a)(7).

276. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Data Reporting and Recordkeeping Under the Toxic Substances Control Act (TSCA); Change to Submission Period and Technical Correction, 89 Fed. Reg. at 72336.

increased resources to meet those obligations, including a 5 percent reduction to the TSCA program in Fiscal Year 2024 . . . and an unfunded Cost of Living Adjustment for FY 2024" forced its hand.[277] This diminished EPA's contractor budget, reducing contractor work on "the TSCA information technology software and related portfolio" by more than 50 percent.[278] Without symmetry between EPA's obligations and resources, especially funding for TSCA itself and data collection, EPA is backed into a corner. PFAS action must now be delayed because EPA needs to first preserve its already ongoing work protecting health and public safety.[279] After a long uphill battle, EPA still faces obstacles in effectively carrying out its duties.

As a counter-effort, EPA has made progress on the public facing Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act.[280] However, the Toxic Release Inventory's public information goal differs from the Central Data Exchange's purpose, which is to give EPA intel on PFAS production and use in commerce to assist in rulemaking.[281]

When we look to make sense of EPA action and inaction, barriers to effective rulemaking are still, half a decade later, related to information barriers. PFAS being a complex chemical class with thousands of variations exacerbates the information challenges. Regulatory solutions must enable EPA to obtain compliance and accurate information from manufacturers. In tandem, EPA should be better enabled to make significant risk determinations under TSCA and enjoin uses of PFAS.[282] In order to achieve this, the EPA administrator must be given broad range while interpreting an unreasonable risk posed by a chemical substance under Section 6(a) of TSCA.

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277. *Id.* at 72338.

278. *Id.* at 72339.

279. *Id.* at 72336.

280. Implementing Statutory Addition of Certain Per- and Polyfluoroalkyl Substances (PFAS) to the Toxics Release Inventory Beginning With Reporting Year 2024, 89 Fed. Reg. 43331 (May 17, 2024) (to be codified at 40 C.F.R. pt. 372) (effective June 17, 2024).

281. *CDR and TRI Comparison*, U.S. EPA, https://www.epa.gov/chemical-data-reporting/cdr-and-tri-comparison [https://perma.cc/R3G5-4M7N] (last updated Mar. 11, 2024).

282. *See* 15 U.S.C. § 2604 (regarding new use notices from manufacturers); § 2605 (proscribing the priority designation process for chemical substances which "may present an unreasonable risk of injury to health or the environment because of a potential hazard and a potential route of exposure").

EPA should not just be empowered, but also actually *able*, to halt levels of production, manufacturing, use, and disposal of newly identified toxic chemicals while it conducts its research-based regulatory process. A broader Section 6(a) of TSCA, enabling a quicker halting provision for EPA would ideally prevent, and at least mitigate, ongoing contamination before effective rules may be proposed and finalized. This is an imperative step to prevent another similar pollution conundrum. As demonstrated by the situation created from PFAS, if EPA waits too long to "effectively" promulgate rules because of necessary extensive research required to inform rules, it inadvertently foregoes its limited window to effectively regulate existing and ongoing contamination. With mass contamination from manmade chemical compounds, prevention provides better outcomes than remediation following more than twenty years of ongoing pollution.

One concern with this recommendation is that companies could violate reporting requirements like DuPont did and fly under the provision's radar, rendering it ineffective. There are two ways to address this. First, EPA can clarify its protections are meant to encourage heroes like Rob Bilott[283] while refining its immediate response. Even though existing pollution will have already occurred, an earlier response would better stop it in its tracks. Consider what wider EPA authority under Section 6(a) could have done in 2002 before PFAS pollution got out of hand and DuPont conducted its allegedly fraudulent transfer scheme. The PFAS conundrum could have been largely avoided. An emergency provision in 2002 would have stopped bad industry actors and granted EPA an opening to regulate before PFAS pollution became omnipresent. Second, EPA can create, make clear, and enforce stronger punitive measures against noncompliant companies. Ultimately, these steps show Americans that their health and their environment matter more than protecting unethical corporations' bottom lines or viability. In acknowledging the devastating severity and inescapable permanence of PFAS contamination, EPA should take this step to prevent another episode of mass pollution from harming public health, the environment, and costing billions to remediate.

283. Nathan 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 [https://perma.cc/9USA-Y4QU].

CONCLUSION

PFAS contamination, originating from unethical violations of environmental compliance standards, poisoned the American people and destroyed natural resources. These are the real costs, and they persist today. It is unconscionable to posture that imposing financial liability on bad actors, namely DuPont and 3M, to fix PFAS water pollution reaches beyond those real costs.

The multidistrict litigation (MDL) 2873 court can impose damages, financial liability, and ongoing responsibility to ensure liability avenues remain open. The court should not preclude but should, in fact, protect public water systems' avenues for obtaining more funds to address subsequent increased remediation costs for drinking water because PFAS pollution is still ongoing.

Even though EPA is implementing its PFAS National Primary Drinking Water Regulation (NPDWR), limited CERCLA "hazardous substance" designation, and possibly an initial step under RCRA, the total sum of EPA regulatory action has still allowed increased PFAS pollution. From the first two PFAS, there are now almost 15,000 in the growing chemical class, while 3M and DuPont remain largely responsible. Recommended use of short-chain PFAS as safe alternatives encouraged the creation of other PFAS, like GenX, and scholars anticipate short-chain contamination will continue to grow. While CERCLA may be especially helpful for short-chain PFAS that do not pose a threat to public water systems, it is not the best tool for holding DuPont and 3M accountable anymore. The Toxic Substances Control Act (TSCA) compliance should be the backbone of toxic chemical regulation, and EPA must be granted sufficient capacity to carry out TSCA's statutory charges.

Moving forward, progress feels akin to a never-ending cycle of wishy-washy industry compliance driven by incentives other than public health and the environment. From informational challenges and gaps, to a lack of authority and resources for effective regulating, EPA is stuck in a never-ending quandary handling environmental toxins. Breaking out of this cycle and reducing reliance on litigation starts with TSCA. Following the 2016 Amendment, EPA's authority under TSCA is not the largest issue anymore. Now, EPA appears unable to effectively use its authority. EPA has worked tirelessly to adapt, adjust, and overcome, utilizing its wide wheelhouse of regulations to skirt dead ends. The enforceability of the PFAS NPDWR is a

mighty step forward. Coupled with EPA guidance clearly protecting public water systems, there is a narrow gleam of hope. For now, the cost of PFAS remediation in water is largely pursued and protected in MDL 2873. Together, resolving barriers to utilizing TSCA authority and protecting avenues for cost settlements in MDL 2873 and beyond provide for the best financial remedies. In the same spirit that prompted the PFAS NPDWR, protecting drinking water should remain paramount. Financial liability should be consistently enforced to best ensure those protections are successfully carried out.

APPENDIX A. GLOSSARY OF TERMS

Below are definitions of some commonly-used terms.

AFFF	Aqueous film-forming foam
CCL	Contaminant Candidate List; issued by EPA
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
GenX	GenX chemicals comprised of hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt
MDL	Multidistrict litigation
MCL	Maximum contaminant level; binding level in NPDWR
NECI	National Enforcement and Compliance Initiatives; issued by EPA OECA for fiscal year 2024 to 2027
NPDWR	National Primary Drinking Water Regulation; issued by EPA under the SDWA
OECA	Office of Enforcement and Compliance Assurance within EPA
PFAS	Perfluoroalkyl and Polyfluoroalkyl Substances
PFBS	Perfluorobutane sulfonic acid
PFHxS	Perfluorohexane sulfonic acid

PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonic acid
Ppt	Parts per trillion
PWS	Public water system/s like public water utilities
RCRA	Resource Conservation and Recovery Act
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SNUR	Significant New Use Rule; issued by EPA under TSCA
TSCA	Toxic Substances Control Act with 2016 amendments from the Frank R. Lautenberg Chemical Safety Act
UCMR	Unregulated Contaminant Monitoring Rule; issued by EPA