

A BLAST FROM THE PFAST; FOREVER CHEMICALS COMING BACK TO HAUNT US AND HOW INTERNATIONAL REGULATORY SCHEMES CAN SUPPLEMENT UNITED STATES LAW

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I. INTRODUCTION

In 2019, Mark Ruffalo starred as Robert Bilott in the film *Dark Waters*.² *Dark Waters* follows an Ohio attorney as he uncovers severe pollution and pursues a suit against a major chemical company, DuPont.³ The film is based on the real events and life of Robert Bilott, who investigated and built a case for residents of Parkersburg, West Virginia against DuPont for dumping toxic waste into the town landfill, thereby contaminating the drinking water.⁴ DuPont's waste subjected the people of Parkersburg to exposure and consumption of carcinogenic chemicals. Through Bilott's work, thousands of residents were able to get payouts from DuPont for medical ailments.⁵ Though this film is a drama, the story is far from fiction. It is the real story of the impact of per- and poly-fluoroalkyl substances (PFAS), and it is not limited to Parkersburg. This PFAS story is one that stretches internationally to nearly every country.

PFAS is a general name for a family of thousands of "forever chemicals."⁶ They are lingering man-made carcinogenic chemicals that are used in many everyday

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² Alejandro De La Garza, *Dark Waters Tells the True Story of the Lawyer Who Took DuPont to Court and Won. But Rob Bilott's Fight is Far From Over*, TIME MAGAZINE (Nov. 25, 2019), <https://time.com/5737451/dark-waters-true-story-rob-bilott/> [<https://perma.cc/8FBC-9HYK>].

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ U.S. ENV'T PROT. AGENCY, *PFAS Explained*, EPA.GOV, <https://www.epa.gov/pfas/pfas-explained> (last updated Oct. 18, 2021) [<https://perma.cc/HK2H-GV8W>] (explaining the EPA's understanding of PFAS).

items.⁷ Products ranging from non-stick pans to food packaging contain PFAS.⁸ Virtually everyone on Earth has been exposed to some sort of PFAS contamination. Yet, there is currently no comprehensive federal regulation for PFAS in the United States.

PFAS contamination is one of the largest threats to the environment and human health right now. However, many Americans are not even aware of the problems PFAS pose. The Environmental Protection Agency (EPA) has not yet regulated these chemicals, but it recommends that safe drinking water contain levels of PFAS of less than 70 parts per trillion.⁹ Many adults and children surrounding large disposal sites are subjected to increased exposure to these dangerous chemicals.¹⁰ The average American has already been exposed to PFAS in such large quantities that the chemicals are present in the majority of people's blood. Currently, the average person living in the United States likely has around 9.7 parts per billion PFAS in his or her own blood.¹¹ Statistics for individuals closer to PFAS sources can also be staggering.¹²

⁷ *Id.*

⁸ *Id.*

⁹ Erin E. O'Brien, *Reform Needs to Happen Pfast: The Importance of Federal Per- and Polyfluoroalkyl Substance Regulation*, 123 W. VA. L. REV. 233, 234 (2020).

¹⁰ Garret Ellison, *3M, Wolverine settle pollution lawsuit with Michigan family*, MLIVE (Feb. 21, 2020), <https://www.mlive.com/news/ann-arbor/2020/02/3m-wolverine-settle-pollution-lawsuit-with-michigan-family.html>. [<https://perma.cc/GK7A-J56B>].

¹¹ Rebecca Russel, *PFAS levels in Belmont boy's blood 50 times higher than national average*, FOX17 W. MI. (Jan. 10, 2018), <https://www.fox17online.com/2018/01/10/pfas-levels-in-belmont-boys-blood-50-times-higher-than-national-average/>.

¹² *Id.* (explaining a Michigan boy's blood contained 484 parts per billion PFAS in his bloodstream compared to the average around 9.7 parts per billion).

Families living in and around manufacturers using PFAS have found alarming amounts of forever chemicals in their blood. In 2018, a Michigan family, the McNaughtons, endured a nightmare after discovering their water supply was contaminated with PFAS from a nearby 3M distribution site.¹³ But the real shock came when they discovered their twenty-month-old son's blood contained around 484 parts per billion of PFAS.¹⁴ The McNaughton family realized too late that its water source was contaminated. They became the lead plaintiffs in a suit against 3M and another manufacturer for the contamination of the drinking water.¹⁵ In February of 2020, the McNaughton family settled out of court with 3M for an unspecified amount.¹⁶ Their son is now two years old, and the parents note that he is still experiencing immune-system issues and abnormal health problems.¹⁷ The McNaughton family's story is concerning. And, to add insult to injury, the United States still lacks comprehensive legislation to deal with PFAS.

Currently, proposed legislation titled the PFAS Action Act is making its way through Congress.¹⁸ However, this proposed Act will not do enough to fix the problems the world is facing with these forever chemicals. PFAS are not under any official regulation by the Environmental Protection Agency ("EPA"). These chemicals contribute to widespread environmental and health issues resulting from their

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ Ellison, *supra* note 10.

¹⁷ Russel, *supra* note 11.

¹⁸ H.R. 2467, 117th Cong. (2021).

release into drinking and ground water.¹⁹ PFAS are gaining attention from the public as the resulting health effects become more prevalent in the media.

The EPA started to make progress in regulating PFAS under several major pieces of regulation.²⁰ Unfortunately, the attempts to regulate are underinclusive and unenforced. They do not include all chemicals in the PFAS family.²¹ They also fail to hold companies accountable for their contributions to pollution.²² The options that are currently available are not enough to protect people and the environment from PFAS contamination.

Other countries have proposed differing solutions to deal with and regulate these forever chemicals and emerging contaminants. European countries have come up with a variety of solutions that would be advantageous supplements to the regulations the United States already has in place.²³ Adding these ideas to the current legislative plan for combatting PFAS would be more effective in preventing further contamination. PFAS contamination cannot be stopped by the current legislation making its way through Congress or the proposed regulations by the EPA; the answer to the PFAS problem lies in approaches borrowed from other countries

¹⁹ U.S. ENV'T PROT. AGENCY, *supra* note 6.

²⁰ U.S. ENV'T PROT. AGENCY, *PFAS Strategic Roadmap; EPA's Commitments to Action 2021-2024*, EPA.GOV (Oct., 2021), https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf [<https://perma.cc/6S22-VDYJ>] (describing the EPA's plan to address PFAS contamination regulation in the upcoming years).

²¹ *Id.*

²² U.S. ENV'T PROT. AGENCY, *supra* note 6; *see* background *infra* Section II.B.1 (discussing the downfalls of the current proposed and in place legislation dealing with PFAS).

²³ John Gardella, *Cos. Should Prepare Now For European PFAS Regs*, LAW360 (July 16, 2020), <https://law360.com/> (search "Cos. Should Prepare Now For European PFAS Regs" from search bar; then follow hyperlink) (explaining the steps taken by European countries to address forever chemical contamination).

and international organizations to create a more aggressive and expansive regulatory scheme.

This note details proposals for supplementing current United States legislation to be more effective in regulating forever chemicals like PFAS. The first section of this paper will provide an overview of PFAS and the problematic attempts at regulation so far. The next section analyzes the current PFAS Action Act and its faults. Finally, the third section proposes multiple ideas and models gleaned from other nations for improving the current regulatory plan to create a better comprehensive approach to PFAS legislation. In examining the current United States approaches with the strategies taken by other nations, the goal is to find a way to use the strengths of the other proposals to complement the current United States plan.

II. BACKGROUND

A. *PFAS; What are they and why do they matter?*

PFAS are per-polyfluoroalkyl substances, a group of synthetic man-made chemicals used in many production and manufacturing industries.²⁴ PFAS are made up of organic compounds including a distinguishable feature of fluorinated carbon chains.²⁵ They are a family of thousands of different chemicals with similar chemical structures.²⁶ The most commonly used chemicals in the PFAS family are per-fluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). These two chemicals are the most prevalent in contamination reports, though the entire PFAS

²⁴ U.S. ENV'T PROT. AGENCY, *supra* note 6.

²⁵ Amila O. De Silva, et. al., *PFAS Exposure Pathways for Humans and Wildlife: A Synthesis of Current Knowledge and Key Gaps in Understanding*, 40 ENV'T. TOX. & CHEM. 631, 632 (2021).

²⁶ O'Brien, *supra* note 9, at 234.

family is potentially harmful.²⁷ The chemical characteristics of PFAS are what contribute to their disastrous effect on both humans and the environment. They are known as forever chemicals due to their extremely long half-life and bioaccumulation properties.²⁸ Chemicals that bioaccumulate will build in concentration as they remain in a living organism or soil.²⁹ Due to their chemical composition, PFAS are highly resistant to biodegradation and extreme environmental factors.³⁰ This means that they can be incredibly difficult to break down and remain in the environment indefinitely. These chemicals are also easily absorbed into the soil or waterways in the areas where they are discharged.³¹

The chemical makeup of PFAS is what makes them desirable for manufacturing consumer products. Major companies like DuPont, 3M, and GORE-TEX have utilized PFAS for decades in manufacturing their widely used non-stick and water resistant products.³² These forever chemicals have water-repelling, non-stick, and preservation properties that companies utilize in day-to-day processing and production.³³ PFAS are commonly found in cleaning products, non-stick pans, waterproof or repellant fabrics, clothing, firefighting foams, plastic packaging, and insulation.³⁴ The ease and convenience of products containing PFAS allowed them to

²⁷ U.S. ENV'T PROT. AGENCY, *supra* note 6.

²⁸ *Id.*

²⁹ Hannah Levine, *Zombie Chemicals-Learning from Our Past to Prevent Haunting in the Future: Why the EPA Should Regulate Pfas Chemical Compounds*, 21 VT. J. ENV'T. L. 177, 184 (2019).

³⁰ O'Brien, *supra* note 9, at 234.

³¹ Levine, *supra* note 29, at 183.

³² *Id.* at 182.

³³ Noel M. Johnson, *Me-Fas, You-Fas, We All Eat Pfas: What to Do About the Forever Chemical*, 21 U. PITT. J. TECH. L. POL'Y 134, 136 (2021).

³⁴ U.S. ENV'T PROT. AGENCY, *supra* note 6.

quickly make their way into nearly every American household. The widespread use of and demand for PFAS products has led to the prevalence of PFAS contamination in the United States.

PFAS are distributed into the environment through products, exposure, and consumption.³⁵ The most prevalent PFAS in the environment, PFOA and PFOS, come into contact with consumers in different ways. PFOA exposure typically results from contact with products containing fluoropolymer properties, that is water repellent or resistant properties.³⁶ PFOS exposure usually results from contact with packaging on food or clothing items containing PFAS.³⁷ In general, PFAS tend to enter the environment through waterways and soil absorption.³⁸ Food packaging containing PFAS will end up in landfills, and the soil can absorb the chemicals.³⁹ The EPA listed common sources of PFAS contamination and exposure as drinking water, soil near manufacturing waste sites, fire-extinguishing foam, manufacturing waste and materials, food and food packaging, household products, personal care products, and biosolids like fertilizer.⁴⁰ Most Americans have been exposed to PFAS contamination through their use or consumption of consumer products.⁴¹ Fifteen million Americans are exposed to PFAS from their tap water.⁴² This fact is more alarming considering

³⁵ U.S. ENV'T PROT. AGENCY, *Our Current Understanding of the Human Health and Environmental Risks of PFAS*, EPA.GOV, <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas> (last updated Dec. 20, 2021) [<https://perma.cc/67P8-X8DP>].

³⁶ De Silva et al., *supra* note 25, at 633.

³⁷ *Id.*

³⁸ Levine, *supra* note 29, at 183.

³⁹ *Id.*

⁴⁰ U.S. ENV'T PROT. AGENCY, *supra* note 35.

⁴¹ *Id.*

⁴² Levine, *supra* note 29, at 183.

that research shows the detrimental effects PFAS can have on people and their surroundings.

PFAS can have adverse effects on human health and the environment. PFAS' chemical composition makes them a forever chemical.⁴³ One common characteristic of forever chemicals is that they remain in the environment almost indefinitely.⁴⁴ Even more startling, forever chemicals like PFAS bioaccumulate once they are in the environment.⁴⁵ These properties result in the adverse health effects on humans. The EPA's research on human health effects provides a disturbing overview of potential damage from PFAS exposure.⁴⁶ PFAS have been shown to cause issues with the reproductive system, development, and the immune system.⁴⁷ Research has found that PFAS are linked to various cancers, specifically kidney and testicular cancer.⁴⁸ PFAS exposure during pregnancy can have disastrous consequences including birth defects, learning disabilities, miscarriages, and fertility issues.⁴⁹ Additionally, exposure to PFAS can potentially render vaccines ineffective.⁵⁰ The current pandemic has amplified this concern of PFAS exposure on human health due to the increasing importance of vaccines in society.⁵¹

⁴³ U.S. ENV'T PROT. AGENCY, *supra* note 35.

⁴⁴ Levine, *supra* note 29, at 180.

⁴⁵ O'Brien, *supra* note 9, at 236.

⁴⁶ U.S. ENV'T PROT. AGENCY, *supra* note 35.

⁴⁷ *Id.*

⁴⁸ 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, 93 (2020).

⁴⁹ *Id.* at 100.

⁵⁰ *Id.*

⁵¹ Mark P. Nevitt and Robert V. Percival, *Can Environmental Law Solve the "Forever Chemical" Problem?*, 57 WAKE FOREST L. REV. 1, 9 (2021).

The survival of the ecosystems where PFAS are concentrated is also at risk.⁵² Animal exposure to PFAS causes similar effects to those seen in humans; mostly affecting the reproductive and immune systems.⁵³ Plants and vegetation uptake PFAS from groundwater and soil. At that point, the plants are contaminated and any organism using them as a food source will also be contaminated.⁵⁴ Plant death and visible abnormalities in vegetation are also common in areas of PFAS groundwater concentration.⁵⁵ Additionally, due to the presence of PFAS in some fertilizer, there is a growing concern that crops will be negatively affected.⁵⁶

The prevalence of PFAS in both humans and the ecosystem led to a recent push for action from regulatory agencies like the EPA. Due to the severity of PFAS contamination, the federal government needs to create stronger regulations to curb contamination and prevent further exposure.

B. Previous attempts to regulate PFAS.

Domestically, the federal government tried multiple strategies to address and limit PFAS contamination in the United States. One of the earliest attempts was a voluntary program known as the PFAS Stewardship Program.⁵⁷ This program provided an option for major manufacturers and producers of PFAS products to gradually reduce PFAS use, specifically limiting PFOA use.⁵⁸ The program was

⁵² Leticia M. Diaz & Margaret R. Stewart, *"Forever Chemicals": Forever Altering the Legal Landscape*, 7 BELMONT L. REV. 308, 323 (2020).

⁵³ Johnson, *supra* note 48, at 100.

⁵⁴ *Id.*

⁵⁵ *Id.* at 101.

⁵⁶ *Id.* at 100.

⁵⁷ O'Brien, *supra* note 9, at 244.

⁵⁸ U.S. ENV'T PROT. AGENCY, *Fact Sheet: 2010/2015 PFOA Stewardship Program*, EPA.GOV, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program> (last updated Mar. 4, 2021) [<https://perma.cc/XN8Y-L8B2>].

implemented by the EPA and had goals of reducing PFAS waste and ultimately stopping use of PFAS by 2015.⁵⁹ The program successfully led to a reduction of PFOA used in manufacturing processes.⁶⁰ Yet, the program's time period ended and there is no enforcement or incentive to continue the practices that were implemented during the program.⁶¹

Because PFAS exposure commonly occurs through drinking water, the federal government also attempted to control the PFAS problem under the Safe Drinking Water Act (SDWA).⁶² Pursuant to this statutory directive, the EPA issued a health advisory for PFAS chemicals under the SDWA.⁶³ This health advisory proposed a limit of PFAS present in the drinking water supply before there is a serious risk of adverse health problems.⁶⁴ However, this health advisory is an unenforceable limit on PFAS use and serves only as an informative suggestion to manufacturers and producers.⁶⁵ Under the SDWA, the EPA has also made progress in issuing a National Primary Drinking Water Regulation (NPDWR).⁶⁶ This regulation, if passed, will make those health advisories enforceable. It would enable the EPA to create and enforce maximum contaminant levels for amounts of PFAS in drinking water.⁶⁷ This

⁵⁹ O'Brien, *supra* note 9, at 245.

⁶⁰ U.S. ENV'T PROT. AGENCY, *supra* note 58.

⁶¹ *Id.*

⁶² U.S. ENV'T PROT. AGENCY, *EPA Actions to Address PFAS*, U.S. EPA, <https://www.epa.gov/pfas/epa-actions-address-pfas> (Last updated Jan. 21, 2022) [<https://perma.cc/4KY4-MHHB>].

⁶³ U.S. ENV'T PROT. AGENCY, *Drinking Water Health Advisories for PFOA and PFOS: Health Advisories*, U.S. EPA, <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos> [<https://perma.cc/MM29-D759>].

⁶⁴ Levine, *supra* note 29, at 181.

⁶⁵ *Id.*

⁶⁶ U.S. ENV'T PROT. AGENCY, *supra* note 9.

⁶⁷ *Id.*

remains one of the most promising ways the EPA is attempting to diminish PFAS use. However, the NPDWR would focus only on PFOA and PFOS.

Another important step being taken is the drafting of the PFAS Action Act (the “Act”).⁶⁸ This Act is currently pending in the Senate after being passed as a bill in the House of Representatives.⁶⁹ This is the most recent piece of legislation aimed at preventing further PFAS contamination. It proposes a number of improvements to the current regulatory scheme in the United States. The first proposal under the Act is the designation of PFOA and PFOS as hazardous chemicals under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) within one year of the Act’s passage.⁷⁰ It would also force the EPA to determine whether the other PFAS should be designated under CERCLA within five years.⁷¹ This designation would allow easier enforcement of PFAS regulations and monitoring of manufacturers responsible for the release of PFOA and PFOS into the environment. The Act also proposes altered testing requirements, including required testing. In short, any PFAS chemicals found in the environment would be required to undergo toxicity testing to determine any potential risks.⁷²

Additionally, the Act would establish manufacturing and processing notices under the Substances Control Act. Distributors of products containing PFAS would have to place warnings of the health risks of PFAS on their products.⁷³ As mentioned

⁶⁸ H.R. 2467, 117th Cong. (2021).

⁶⁹ *H.R. 2467-PFAS Action Act of 2021*, CONGRESS.GOV (2021), <https://www.congress.gov/bill/117th-congress/house-bill/2467> [<https://perma.cc/K4UB-NFKB>] (last visited Jan. 25, 2022).

⁷⁰ H.R. 2467.

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

above, the EPA would also issue a National Primary Drinking Water Regulation under the SDWA.⁷⁴ The proposed regulation would provide standards of use for PFOA and PFOS and allow agencies to closely monitor manufacturers to ensure compliance.⁷⁵ The Act would list PFAS as hazardous air pollutants and allocate funding for grants to clean up PFAS contamination sites.⁷⁶ The PFAS Action Act has been sent to a committee in the Senate where it awaits a decision.⁷⁷

In October of 2021, the EPA released a new PFAS Roadmap listing the goals for regulations and monitoring of PFAS in the next few years.⁷⁸ The new EPA approach has placed an emphasis on some major areas of PFAS regulation. The first area of concern under the 2021 PFAS Roadmap is addressing not only reclamation efforts, but also reducing circulation of PFAS products in commerce in the United States.⁷⁹ Another area the PFAS Roadmap focuses on is preventing PFAS and other forever chemicals from getting into the environment altogether. The EPA plans to limit the disposal methods and cleanup sites that are causing major contamination of the environment.⁸⁰ The EPA also wants to encourage holding manufacturers accountable for PFAS pollution..The point is to put pressure on major companies to clean up contamination that they are responsible for.⁸¹ Additionally, the PFAS

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ H.R. 2467.

⁷⁷ *Id.*; PFAS Action Act of 2021, <https://www.congress.gov/bill/117th-congress/house-bill/2467/text> (last visited Mar. 20, 2022) [<https://perma.cc/66Q3-M2WN>] (describing the current progress of the PFAS Action Act through the legislative process).

⁷⁸ U.S. ENV'T PROT. AGENCY, *supra* note 20.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

Roadmap shifts attention to research-based decision-making as a result of funding new research programs and scientific developments.⁸² The goal of the new research is to make informed regulations that will decrease the adverse effects of pollution on the community. Finally, the PFAS Roadmap places an emphasis on providing equal protections for those lower-income and disadvantaged communities who are the most vulnerable to pollution effects and risks.⁸³

In November of 2022, the EPA issued a progress report on the 2021 PFAS Roadmap.⁸⁴ In this progress report, the EPA highlighted some key accomplishments following the October 2021 PFAS Roadmap. To start, the EPA issued its first testing order including PFAS under the goal of directing research toward emerging chemicals.⁸⁵ Also, the EPA is involved in implementing Executive Order 14057 to help prioritize federal spending on products that do not contain PFAS.⁸⁶ Additionally, in December of 2021, the EPA finalized an Unregulated Contaminant Monitoring Rule requiring testing for almost thirty PFAS in drinking water.⁸⁷ The EPA has also recommended water quality criteria for PFOA and PFOS as of April of 2022.⁸⁸ The criteria is meant to protect aquatic life by preventing PFAS from entering into the environment.⁸⁹ The EPA also announced that it has made progress in its plans to

⁸² *Id.*

⁸³ *Id.*

⁸⁴ U.S. ENV'T PROT. AGENCY, *EPA's PFAS Strategic Roadmap: A Year of Progress*, EPA.GOV (Nov., 2022), https://www.epa.gov/system/files/documents/2022-11/PFAS%20Roadmap%20Progress%20Report_final_Nov%2017.pdf [<https://perma.cc/66NS-J845>] (describing the EPA's progress on the October 2021 roadmap).

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.*

create more regulations and hold large manufacturers accountable for their contributions.

Additionally, the progress report stated that President Biden has provided over fifty million dollars in funding for the EPA to invest in drinking water and wastewater infrastructure through the Bipartisan Infrastructure Law (BIL).⁹⁰ The EPA announced that it can use this funding for grants and programs to address emerging contaminants like PFAS.⁹¹

C. International methods for PFAS elimination and cleanup.

The United States is not the only country working to remove PFAS from its products and market. One of the most notable international organizations moving to make changes in their regulation of PFAS is the European Union (“EU”).⁹² The EU is attempting to control PFAS contamination through the Registration, Evaluation, Authorization, and Restriction of Chemicals (“REACH”) program.⁹³ Under REACH, responsibility for cleanup efforts and funding reclamation projects will shift from the government to the organizations that caused contamination of the site.⁹⁴ REACH also placed restrictions on products being sold to the EU containing PFAS.⁹⁵ Some PFAS were listed under REACH as Substances of Very High Concern (“SVHC”).⁹⁶ This designation is similar to the above-mentioned CERCLA designation, but harsher because it lists those chemicals that are considered to be carcinogens. Also, REACH

⁹⁰ U.S. ENV’T PROT. AGENCY, *supra* note 84.

⁹¹ *Id.*

⁹² Gardella, *supra* note 23.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.*

is starting to regulate newly emerging PFAS, known as GenX chemicals. Companies have increased use of these chemicals to try to find a way around PFAS regulation.⁹⁷ These restrictions have generally limited PFAS products to those which are of essential use.⁹⁸ Later, this note will explain essential use both as a method and a phrase.

The EU, like the United States, has regulatory bodies in place that create and control drinking water legislation and standards.⁹⁹ Currently, there are proposals to limit the accepted amount of PFAS in drinking water to 0.5 micrograms per liter.¹⁰⁰ This is a regulation for the entire PFAS family and not just those commonly found in the water supply.¹⁰¹ The regulation allows the EU to monitor drinking water exposure and gives the government a basis of enforcement to punish those who violate the regulation standards.

Additionally, there are other international organizations working together to reduce the production of PFAS products. The Stockholm Convention (the “Convention”) is a global treaty formed to protect human health from exposure to forever chemicals and to remove them from the environment.¹⁰² The Convention created a list known as Annex A.¹⁰³ Annex A contains chemicals that members of the

⁹⁷ *Id.*

⁹⁸ Kathleen Garnett and Geert Van Calster, *The Concept of Essential Use: A Novel Approach to Regulating Chemicals in the European Union*, 10:1 TRANSNAT'L ENV'T L. 159, 163 (2021).

⁹⁹ Gardella, *supra* note 23.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² *The Convention: Overview*, STOCKHOLM CONVENTION (2019), <http://www.pops.int/TheConvention/Overview/tabid/3351/Default.aspx> [<https://perma.cc/7NHC-C4P9>].

¹⁰³ *Id.*

Convention are encouraged not to use in their manufacturing. Currently, Annex A lists PFOA as an encouraged prohibited chemical.¹⁰⁴

Some nations, like Denmark, have taken efforts to prevent further PFAS damage.¹⁰⁵ They have initiated a complete ban of PFAS in any of their products that come into contact with food to try and limit exposure.¹⁰⁶ The problem with these new chemicals is they have the potential to be just as harmful and there is less research on their use.¹⁰⁷ They are known as GenX chemicals and pose a serious risk of creating a whole new class of carcinogenic and dangerous forever chemicals because of the movement away from PFAS use.¹⁰⁸ When regulations of PFAS are imposed and enforced, companies will look for alternatives to meet the demand for their products. This will ultimately result in GenX chemicals replacing PFAS, unless preventative action is taken.

Both at home and internationally, governments are moving toward decreased use of PFAS in manufacturing and production. Combining aggressive global strategies to eliminate PFAS with the United States' current regulations, the federal government has an opportunity to effectively combat forever chemicals.

III. THE CURRENT PROPOSED LEGISLATION AND REGULATIONS ARE NOT ENOUGH

The proposed regulations in the United States fall short of offering a sufficient solution to this environmental problem. The legislation moving through Congress will

¹⁰⁴ *Id.*

¹⁰⁵ Gardella, *supra* note 23.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ Diaz, *supra* note 52, at 309.

do little to prohibit further introduction: simply put, the current legislative response is not proportional to the problems these forever chemicals pose. Other developed nations, though, continue to make progress in preventing further PFAS damage. The United States must amend its current plan for PFAS to include the entirety of the PFAS family in more aggressive regulations borrowed from other nations to address a problem of this magnitude.

A. PFAS Action Act proposes a minor solution to a major problem.

The PFAS Action Act currently sent to committee in the Senate will not be enough to slow the present pace of PFAS contamination. There are various shortcomings with the proposed legislation. Fixing a crisis the size of PFAS contamination requires more than a band-aid solution that ignores the root of the problem.

i. The PFAS Action Act only includes well-known PFAS.

One of the biggest problems with the PFAS Action Act is its focus on PFOA and PFOS.¹⁰⁹ PFOA and PFOS are major contributors to environmental contamination, but they are not the only threat.¹¹⁰ In reality, those are just two of the thousands of chemicals that make up the PFAS family.¹¹¹ Due to the size of the PFAS family, consisting of nearly 5,000 chemicals, a substance-by-substance approach to regulation is impractical.¹¹²

A proposed solution in the Act is the designation of PFOA and PFOS as hazardous substances under CERCLA.¹¹³ The Act also gives the EPA five years to decide

¹⁰⁹ H.R. 2467.

¹¹⁰ U.S. ENV'T PROT. AGENCY, *supra* note 6.

¹¹¹ *Id.*

¹¹² Garnett and Van Calster, *supra* note 98, at 163.

¹¹³ H.R. 2467.

whether to designate the remainder of the PFAS family.¹¹⁴ Additionally, the PFAS Action Act proposes a NPDWR for PFOA and PFOS that must be imposed within two years of the Act's passage.¹¹⁵ Like the CERCLA designation, it would be more effective to include all PFAS in the proposed regulation instead of limiting restrictions to just PFOA and PFOS. Initially, the CERCLA designation and NPDWR proposal seem like steps in the right direction. Sadly, however, those steps are to the side, not forward. The Act is centered on designating well-researched chemicals as opposed to the entire group. The problem is that this method will only make it more difficult for regulation to keep up with contamination caused by similar substances as PFOA and PFOS are replaced in manufacturing.¹¹⁶

As a solution, the Act should start by listing all PFAS as hazardous substances. Designating PFAS as a category would prevent inevitable substitutes for PFOA and PFOS from escaping the restrictions implemented in the proposed legislation. Including all PFAS in the Act prevents having to continuously push legislation as science changes and identifies additional dangerous members of the PFAS family. Many of the PFAS chemicals have not been well researched or tested yet.¹¹⁷ If the EPA continues with its current chemical-by-chemical approach to regulation, it will likely have to propose new regulations every time a new chemical is discovered or utilized in manufacturing. This will be both expensive and time-consuming. It may be easier in the short term to regulate a little at a time to get the legislation to pass.

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ Johnson, *supra* note 33, at 139.

¹¹⁷ *Id.*

However, the lack of comprehensive regulation will fail to protect the people and environment as needed. It is not practical to regulate in a chemical-by-chemical fashion until thousands of chemicals are researched.¹¹⁸ Forever chemicals should be presumed hazardous until it can be shown otherwise.

A major concern in designating the entire PFAS family is that it will be too big of a shock for the manufacturing and production industries to absorb.¹¹⁹ The towns that have grown around these large factories rely on their economic activity and job opportunities to sustain their community.¹²⁰ While economic growth and maintenance are important, the health and safety of the community should take priority. Taking out one or two chemicals at a time from the economy will only further delay the progression of economic cleanup. There are alternatives available to the industries that rely on PFAS; they just come at a cost.¹²¹ But the benefits of those alternatives are healthy citizens and a clean environment. This would lead to short-term consequences for the current market, but long-term benefits of a sustainable manufacturing process and healthy communities.

The effect on manufacturing will undoubtedly be significant. But the fact is that without significant impact, no effective change can be made. This is not a problem of prevention of future environmental damage. The PFAS problem is here, and there is no longer an opportunity for prevention. By designating all PFAS as hazardous

¹¹⁸ *Id.*

¹¹⁹ Lydia Gonzalez Gromatzky, CONGRESS PRESSES FORWARD ON PFAS MEASURES, 26 WESTLAW J. ASBESTOS 10, 48 (2021).

¹²⁰ *Id.*

¹²¹ *Id.*

chemicals under CERCLA, the legislature could begin to require sustainable alternatives to prevent even more environmental damage.

ii. *The PFAS Action Act will be difficult to enforce without strict liability.*

The CERCLA designation of PFOA and PFOS would subject major companies to strict liability for their role in community contamination.¹²² Yet, most of the PFAS family are not included.¹²³ As a result, the Act fails to hold manufacturers strictly liable for the release of PFAS chemicals that are not PFOA and PFOS. CERCLA allows courts to hold major contaminators strictly liable for any damage done to the environment and for cleanup and restoration costs.¹²⁴ Currently, there are suits addressing PFAS cleanup and contamination pending in state courts.¹²⁵ However, plaintiffs have had difficulty proving that manufacturers are the source of contamination.¹²⁶ It is nearly impossible to trace a specific chemical back to its origin with certainty. Thus, much of the litigation has been unsuccessful in attributing contamination to manufacturers and holding them responsible.¹²⁷

A strict liability provision in PFAS legislation would solve some of the problems plaintiffs are having with source identification. It would hold manufacturers accountable for discharging PFAS waste into the environment.¹²⁸ The Clean Water

¹²² Johnson, *supra* note 50, at 142.

¹²³ H.R. 2467.

¹²⁴ Johnson, *supra* note 50, at 142; *see infra* text accompanying note 167.

¹²⁵ Lawrence G. Cetrulo, *PFAS Litigation: Introduction*, TOXIC TORTS LITIGATION GUIDE § 48:17 (Dec. 2021) (listing suits against PFAS manufacturers in various states including Colorado, West Virginia, Ohio, North Carolina, and Minnesota).

¹²⁶ Lawrence G. Cetrulo, *PFAS Litigation: Causation*, TOXIC TORTS LITIGATION GUIDE §48:20 (Dec. 2021).

¹²⁷ *Id.*

¹²⁸ Kepten D. Carmichael, *Strict Criminal Liability for Environmental Violations: A Need for Judicial Restraint*, 71 INDIANA L.J. 729, 747 (1996), http://ilj.law.indiana.edu/articles/71/71_3_Carmichael.pdf [<https://perma.cc/2BZ2-PSXQ>].

Act (the “CWA”) can be a model.¹²⁹ It has a strict liability provision that applies to anyone who knowingly violates the act.¹³⁰ A strict liability provision guarantees manufacturer accountability if it is shown that the company failed to comply with CWA standards.¹³¹

However, there are potential problems with enforcing strict liability against manufacturers.¹³² Strict liability creates a risk of assigning blame to the wrong corporation.¹³³ There are likely areas where multiple sources are contributing to the contamination in the environment. In these areas, it is possible that the responsibility could be apportioned based on fault.¹³⁴ Toxic tort, diethylstilbestrol (“DES”), and asbestos cases can serve as a model for PFAS liability as well.¹³⁵ In these cases, market share liability determined the share of fault afforded to each manufacturer in suits brought against them.¹³⁶ By implementing a similar system with PFAS contamination, the government could hold manufacturers responsible for the proportion of hazardous chemicals they discharged by attributing liability proportional to the percentage of products they distributed into the market. In short,

¹²⁹ 33 U.S.C § 1251.

¹³⁰ Carmichael, *supra* note 128, at 744.

¹³¹ *Id.*

¹³² *Id.*

¹³³ *Id.*

¹³⁴ Andrew B. Nace, *Market Share Liability: A Current Assessment of a Decade-Old Doctrine*, 44 VAND. L. REV. 395, 414 (1991), <https://scholarship.law.vanderbilt.edu/cgi/viewcontent.cgi?article=2472&context=vlr> [<https://perma.cc/SY6L-8BL6>].

¹³⁵ *Sindell v. Abbott Lab’y*, 607 P.2d 924, 612 (Cal. 1980) (deciding that if causation could not be attributed to one manufacturer, multiple manufacturers of the same chemical could be held accountable relative to the share of the product they produced).

¹³⁶ *Id.*

every manufacturer could be responsible for the amount of pollution its processes and products put into the environment.¹³⁷

Placing manufacturers and producers in charge of their own cleanup efforts may also be effective.¹³⁸ These projects are time-consuming and expensive. Requiring states to pay a fine for a violation of environmental regulation will be less effective than requiring manufacturers to oversee and fund reclamation projects. The goal would be to prevent future contamination by making companies responsible for their own contamination. Essentially, it would encourage better business practices by providing incentives to clean up the industrial processes that create the waste.

It may be argued that the companies would not act in good faith to remediate PFAS.¹³⁹ Of course, it can be hard to imagine that companies would be willing to put their best effort into fixing their own mess. However, the EPA or another agency should oversee these efforts to ensure they align with the goals of contamination clean up. Placing an agency or regulatory body in a supervisory role would help this problem. In failing to sufficiently clean up their waste, the responsible parties would simply be punishing themselves further and increasing their own costs should they choose to not follow regulations.

Currently, the PFAS Action Act proposes regulation enforcement through monetary fines.¹⁴⁰ Fines are a common way the government tries to enforce its laws against large corporations. Small fines do not deter these large companies from using

¹³⁷ Nace, *supra* note 134, at 414.

¹³⁸ Gardella, *supra* note 23.

¹³⁹ Carmichael, *supra* note 128, at 744.

¹⁴⁰ H.R. 2467.

PFAS to make products that generate millions of dollars in profits.¹⁴¹ PFAS are incredibly profitable chemicals.¹⁴² But forcing manufacturers to fund reclamation efforts would waste both time and money for as long as they choose to violate the regulation.

iii. GenX chemicals are not regulated under the PFAS Action Act.

GenX chemicals are new emerging forever chemicals that are advancing as a replacement for PFAS.¹⁴³ These chemicals are on the fast track to becoming the next forever chemical problem for the world if they are left unregulated. The Act contains no protection from these chemicals.¹⁴⁴ The only provision for GenX chemicals states the EPA will investigate “methods and means” to prevent their introduction into the environment.¹⁴⁵ This failure to consider restrictions of GenX chemicals will ultimately render any regulation ineffective as a new class of forever chemicals emerges and replaces PFAS.¹⁴⁶

PFAS regulation needs to include restrictions on GenX substances. Ignoring GenX chemicals will render any PFAS legislation useless against a new group of forever chemicals that could prove to be just as harmful.¹⁴⁷ Aggressive regulation of GenX is necessary to prevent future harm from current inaction. GenX chemicals need to be placed under broad restriction until research can determine whether they

¹⁴¹ Miranda Goot, *Emerging Thoughts: A Principled Framework for Regulating Genx As an Emerging Contaminant*, 98 N.C. L. Rev. 629, 633 (2020).

¹⁴² U.S. ENV'T PROT. AGENCY, *supra* note 6.

¹⁴³ Goot, *supra* note 141, at 630.

¹⁴⁴ H.R. 2467.

¹⁴⁵ H.R. 2467, 117th Cong. § 12 (2021).

¹⁴⁶ *Id.*

¹⁴⁷ Goot, *supra* note 141, at 642.

are harmful or not.¹⁴⁸ Releasing a chemical into the environment when the exact danger is unknown will end up costing more in cleanup efforts later. Starting with more aggressive restrictions is the safest way to prevent GenX chemicals from getting beyond legislative control.¹⁴⁹ Strict regulation will prevent the law from falling further behind the science of these chemicals. It would also reduce the need for future legislation to fix what current legislation ignored. Without comprehensive regulation of GenX chemicals, it would be like allowing a new medicine into circulation without first identifying any potential side effects.

The method the government uses to regulate new chemicals, starting with research and ending in regulation, is backwards.¹⁵⁰ The industry should start by preventing GenX use in production until they are found to be safe for use through research.¹⁵¹ If the EPA waits to research and regulate these chemicals, then the damage will already have been done. This is the same situation that has led to PFAS contamination becoming unmanageable. Although an argument can be made that harsh regulations may have a negative impact on innovation, these regulations could also lead to the development of sustainable substitutes in the manufacturing industry. Implementing aggressive regulation could be the catalyst for the development and research of safe alternatives to PFAS.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ Garnett & Van Calster, *supra* note 98, at 165.

¹⁵¹ *Id.*

IV. RECOMMENDATIONS

The United States can improve its regulatory and legislative approaches for PFAS by borrowing solutions from international organizations and other countries. European countries use strategies such as banning forever chemicals, either partially or completely, shifting responsibility to manufacturers of PFAS products, and implementing regulatory schemes to categorize dangerous chemicals. Any of these solutions could supplement and improve current proposals for regulating PFAS in the United States.

A. Model approaches from European countries and organizations.

i. Borrowing bans for manufacturing from the Stockholm Convention.

The concern with PFAS contamination is a global concern. And there are other countries working toward their own solutions to PFAS contamination and exposure.¹⁵² As a part of an international effort to limit contamination, the United States can find inspiration from other countries' regulatory schemes for managing the use of forever chemicals. One of the most comprehensive regulatory schemes came out of the Stockholm Convention on Persistent Organic Pollutants (the Convention) in which the EU played a major role.¹⁵³

A notable regulation discussed at the Convention concerning PFAS was preventing the use of products containing or manufactured with PFAS, specifically PFOA.¹⁵⁴ The countries in the Convention are dedicated to limiting not only their own

¹⁵² Gardella, *supra* note 23.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

production and manufacturing of these products, but also their intake of these products from other countries.¹⁵⁵ This allows them to influence other nations' regulations by refusing to do business with manufacturers in nations that have not yet prohibited the use of these chemicals.¹⁵⁶ In doing so, they are placing economic pressure to implement more aggressive regulations and bans on the use of PFAS products around the world. Part of the reason this approach is effective is that many of the countries involved in the Convention are major economic players.¹⁵⁷ There are 184 countries that are signatories and members of this global treaty.¹⁵⁸ The United States, one of the largest economic powers in the world, however, is not a part of the agreement.¹⁵⁹ The substantial impact the United States has on the global economic market would create an even greater impact on the regulatory schemes of other nations. The benefit of a significant possible impact supports the United States joining the Convention or adopting a similar national policy. The United States needs to come up with a policy like that of the EU in the Convention.¹⁶⁰ The regulation of PFAS should not be just for national manufacturing but global manufacturing as well. The policy should ban forming agreements with international producers and manufacturers unless they agree to comply with internal PFAS regulations.¹⁶¹ This

¹⁵⁵ *Persistent Organic Pollutants Review Committee (POPRC)*, STOCKHOLM CONVENTION (2019), <http://www.pops.int/TheConvention/POPsReviewCommittee/OverviewandMandate/tabid/2806/Default.aspx> [<https://perma.cc/QFD4-VEV2>].

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ STOCKHOLM CONVENTION, *supra* note 155.

¹⁵⁹ Gardella, *supra* note 23.

¹⁶⁰ STOCKHOLM CONVENTION, *supra* note 155.

¹⁶¹ Gardella, *supra* note 23.

would lessen the trade of PFAS products from other countries into the United States, diminishing American exposure to PFAS.¹⁶²

This approach will understandably be met with resistance. Large manufacturers and corporations will argue that this is not feasible and would be too drastic a change to the United States and global markets.¹⁶³ While it is important to acknowledge that this approach would have a significant impact on the way the United States does business internationally, it is not impossible or even unreasonable. One hundred and eighty-four countries, including the EU, China, Japan, and Canada, are already participating in a similar scheme in the Stockholm Convention.¹⁶⁴ Those are major economic players.¹⁶⁵ It would be nothing novel for the United States to implement its own manufacturing and production ban on PFAS products.

However, the United States must take steps to enforce such a ban.¹⁶⁶ While the enforcement may be a major change, it is ultimately necessary to fix this major problem. United States regulation and bans of PFAS use in manufacturing would make a significant difference in the exposure routes of PFAS to humans.¹⁶⁷ Yet, this change would be insufficient if the United States simply allows those domestic manufacturers to be replaced by foreign manufacturers.

¹⁶² *Id.*

¹⁶³ Elicia Mayuri Cousins, Lauren Richter, Alissa Cordner, Phil Brown, & Sokona Diallo, *Risky Business? Manufacturer and Retailer Action to Remove Per- and Polyfluorinated Chemicals From Consumer Products*, 29 *NEW SOLUTIONS* 242, 254 (2019).

¹⁶⁴ STOCKHOLM CONVENTION, *supra* note 155.

¹⁶⁵ *Id.*

¹⁶⁶ Levine, *supra* note 29, at 193.

¹⁶⁷ *Id.*

ii. *Recreating REACH provisions in the United States.*

The EU's REACH provisions should be adopted in the United States.¹⁶⁸ One of the main advancements from REACH is that it shifted the costs of paying for, protecting, and promoting PFAS research and reclamation from the government to responsible parties.¹⁶⁹ REACH is similar to CERCLA because, under its regulations, responsible parties would be required to manage risks of exposure to the chemicals they release.¹⁷⁰ This is like the strict liability provision of CERCLA.¹⁷¹ However, it is not just strict liability under REACH. Instead, it encourages company responsibility before contamination litigation begins.¹⁷² REACH requires that companies provide information about any hazardous compounds to consumers.¹⁷³ It also requires companies to manage potential risks and assess safety issues of the chemicals being used.¹⁷⁴

The EU is using prevention methods prior to the start of litigation through REACH.¹⁷⁵ REACH emphasizes accountability earlier in the process by putting more responsibility in the hands of companies that manufacture PFAS products.¹⁷⁶ Under this approach, companies must think of the consequences of their actions. The responsibility placed on the companies from the initial development of the products

¹⁶⁸ Gardella, *supra* note 23.

¹⁶⁹ *Id.*

¹⁷⁰ REACH, EUROPEAN COMMISSION, https://ec.europa.eu/environment/chemicals/reach/reach_en.htm [<https://perma.cc/8VDM-2EK2>].

¹⁷¹ Nace, *supra* note 133, at 414; *See supra* text accompanying notes 121-23.

¹⁷² EUROPEAN COMMISSION, *supra* note 170.

¹⁷³ Gardella, *supra* note 23.

¹⁷⁴ EUROPEAN COMMISSION, *supra* note 170.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

through the distribution of the products serves as a reminder of potential litigation if regulations are not followed.¹⁷⁷

The United States should implement a similar system to emphasize PFAS manufacturer and producer liability from the initial steps of production.¹⁷⁸ The goal would be to include this as part of a strict liability provision to ensure responsibility among those parties who are the source of major pollutants.¹⁷⁹ It will be easier to hold companies responsible for violating regulations if the companies are aware from the beginning of the manufacturing process that there are consequences of failing to abide by the laws.¹⁸⁰

Manufacturers may misuse their responsibility under such a provision. For example, if manufacturers can create their own warning labels for chemical pollutants, they may do so in a way that tries to reduce liability.¹⁸¹ However, it is unlikely that assigning more responsibility will mean assigning total responsibility.¹⁸² This would require government supervision, like the Stewardship program where companies were working with the government to phase out PFAS use.¹⁸³ The EPA or another agency could create minimum standards to be followed by the manufacturers. The companies would then be responsible for following the standards and implementing them.¹⁸⁴ If not done correctly, they can be held

¹⁷⁷ Gardella, *supra* note 23.

¹⁷⁸ EUROPEAN COMMISSION, *supra* note 170.

¹⁷⁹ *Id.*

¹⁸⁰ Gardella, *supra* note 23.

¹⁸¹ *Id.*

¹⁸² Levine, *supra* note 29, at 183.

¹⁸³ U.S. ENV'T PROT. AGENCY, *supra* note 59.

¹⁸⁴ EUROPEAN COMMISSION, *supra* note 170.

responsible at various points in the manufacturing process, not just after the contamination has occurred.¹⁸⁵

The United States should create more responsibility for PFAS manufacturers from the beginning of their production. This type of provision in the United States legislation for PFAS would aid in strict liability enforcement and help in future litigation against the companies.¹⁸⁶

iii. The Denmark ban.

In 2020, Denmark banned the use of PFAS in any food containers or products that regularly come into contact with food.¹⁸⁷ The United States should implement a similar comprehensive ban on its food packaging. One of the biggest areas of exposure is food and water consumption.¹⁸⁸ Denmark has already realized this and taken action to stop one of the major pathways of PFAS contamination.

The United States legislature creating a ban like Denmark's would be a huge step in regulating exposure to PFAS. Complete bans are the most effective way to prevent exposure to forever chemicals.¹⁸⁹ Simply banning all PFAS from any product all at once would be too drastic for legislators to consider.¹⁹⁰ Starting with one of the main concerns in banning the use of PFAS in food packaging can prompt a shift to complete prohibition of PFAS use.¹⁹¹ Consider it like dipping your toe in the water

¹⁸⁵ *Id.*

¹⁸⁶ Carmichael, *supra* note 127, at 751.

¹⁸⁷ *Denmark Bans PFAS Chemicals in Food Contact Paper and Board*, SAFEGUARDS (May 31, 2020), <https://www.sgs.com/en/news/2020/05/safeguards-07320-denmark-bans-pfas-chemicals-in-food-contact-paper-and-board> [<https://perma.cc/KPY9-K6QM>].

¹⁸⁸ O'Brien, *supra* note 9, at 234.

¹⁸⁹ SAFEGUARDS, *supra* note 187.

¹⁹⁰ Garnett & Van Calster, *supra* note 98, at 163.

¹⁹¹ SAFEGUARDS, *supra* note 187.

before completely submerging yourself in the pool. Here, the pool is comprehensive PFAS legislation.

Passing comprehensive bans is not a task to be taken lightly. It would take time and effort to get such a ban to be accepted and signed into law. But following Denmark's lead of cutting off PFAS contamination in one area of exposure could create an easier legislative pathway in the future.¹⁹² The EPA and other agencies can begin the process of a complete PFAS ban by getting manufacturers and legislators to comply with smaller comprehensive bans.¹⁹³ If this can be done successfully, then later legislation to ban PFAS will have a better chance of being implemented.

B. The Essential Use Method.

The threat of a total ban like Denmark's may open the door for considering slightly less disruptive regulations. One method that is gaining support in Europe is the Essential Use Method.¹⁹⁴ The term "essential use" has been proposed in REACH and the Convention but the concept itself is different.¹⁹⁵ Essential use is a concept of regulatory control in dealing with hazardous substances.¹⁹⁶ Current legislation uses a risk analysis approach to determine what chemicals are prohibited and create permissible level regulations. Essential use is a concept that focuses on the chemical's function and uses in society, but still looks at the potential risks.¹⁹⁷

¹⁹² *Id.*

¹⁹³ Garnett & Van Calster, *supra* note 98, at 163.

¹⁹⁴ *Id.*

¹⁹⁵ EUROPEAN COMMISSION, *supra* note 170; STOCKHOLM CONVENTION, *supra* note 154.

¹⁹⁶ Garnett & Van Calster, *supra* note 98, at 161.

¹⁹⁷ Ian T. Cousins, et al., *The Concept of Essential Use for Determining When Uses of PFASs Can be Phased Out*, 21 ENV. SCIENCE PROCESSES & IMPACTS, 1805 (May 27, 2019) <https://pubs.rsc.org/en/content/articlelanding/2019/em/c9em00163h> [<https://perma.cc/QP3Q-X99T>].

The Essential Use Method could serve as a potential alternative to a complete PFAS ban.¹⁹⁸ One of the strengths of the Essential Use Method is that it begins by categorizing the entire PFAS family as hazardous and as risks to human health.¹⁹⁹ Such a method would eliminate the issue of current regulation only dealing with PFOA and PFOS.²⁰⁰ It also reverses the normal order of the United States legislative process. Instead of assuming all chemicals are safe and then regulating against them as health risks are researched, the Essential Use Method would start from the other side.²⁰¹ All PFAS would be considered dangerous for use unless they are proven safe.²⁰² This would prevent contamination that occurs before research can be done on other hazardous substances.

The Essential Use Method consists of a regulatory scheme covering three categories of substances and products.²⁰³ The first of these categories is the non-essential use category.²⁰⁴ Non-essential use products and substances are those that are convenient, but unnecessary for society to function.²⁰⁵ This group of products would be phased out of use in manufacturing and production because they are not required for safety or health reasons.²⁰⁶ Under non-essential use, products do not need to have an alternative to be non-essential.²⁰⁷ They are simply not necessary to

¹⁹⁸ Garnett & Van Calster, *supra* note 98, at 179.

¹⁹⁹ *Id.* at 167.

²⁰⁰ H.R. 2467; *see* analysis *supra* section III.A.1 (describing the issue of the PFAS Action Act not including the entirety of the PFAS family).

²⁰¹ Garnett & Van Calster, *supra* note 98, at 165.

²⁰² *Id.*

²⁰³ Cousins et. al., *supra* note 197, at 1804.

²⁰⁴ Garnett & Van Calster, *supra* note 98, at 167.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ *Id.*

have in circulation because they are primarily utilized for convenience.²⁰⁸ In short, they would be prohibited from manufacturing because they are not essential for society to function.

The next category consists of products with substitutable uses.²⁰⁹ Products that fall into this category are those that have an alternative that performs the same function and is less dangerous.²¹⁰ The Essential Use Method states that these products are important enough to not be removed entirely but their substitutes should be made widely available and implemented instead of the PFAS versions of the products.²¹¹

The final category is essential use. Essential use products are those that serve a very important function.²¹² These products are often needed for either health or safety reasons and have no current alternatives that are feasible for use or widely available.²¹³ This may include any PFAS products in the medical field or PFAS products used in protection from other hazardous substances.²¹⁴ This category of PFAS products cannot be phased out until an alternative is available because they are necessary for society to function safely.²¹⁵

While other regulatory schemes consider what they term essential use in their proposals, the Essential Use Method concept is different. For example, the

²⁰⁸ *Id.*

²⁰⁹ *Id.*

²¹⁰ Garnett & Van Calster, *supra* note 98, at 167.

²¹¹ *Id.*

²¹² *Id.*

²¹³ *Id.* at 169.

²¹⁴ *Id.*

²¹⁵ *Id.* at 167.

Convention implements a similar consideration.²¹⁶ It considers the use and purpose of some of the chemicals it regulates.²¹⁷ But the difference is that under the Convention, a company need only request that a product be considered for an exemption based on its use.²¹⁸ However, under the Essential Use Method, the product would fall into one of three categories based on objective factors not influenced by the companies who make the product.²¹⁹

REACH also uses the term essential use in some of its provisions.²²⁰ But like the Convention, it is not using it in association with the Essential Use Method.²²¹ It does not consider the societal and environmental impacts of the products like the Essential Use Method does when placing chemicals in one of three categories.²²² While plans and schemes describing essential use have been implemented, the actual Essential Use Method is not currently incorporated into legislation in Europe or elsewhere.²²³

It is argued that the Essential Use Method is not considerate enough of the profitable market of PFAS products that has encouraged widespread use.²²⁴ Large corporations are likely worried that the focus on environmental cleanup will overlook profitability of their products. However, the Essential Use Method still considers

²¹⁶ STOCKHOLM CONVENTION, *supra* note 154.

²¹⁷ Garnett & Van Calster, *supra* note 98, at 169.

²¹⁸ *Id.*

²¹⁹ *Id.*

²²⁰ EUROPEAN COMMISSION, *supra* note 169.

²²¹ Garnett & Van Calster, *supra* note 98, at 169.

²²² *Id.*

²²³ Cousins et al., *supra* note 197, at 1805.

²²⁴ Garnett & Van Calster, *supra* note 98, at 167.

economic interests in its determination of which category PFAS should be under.²²⁵ It simply adds to this both social and environmental considerations so that essential use is not associated only with economic use. This method is also fair in recognizing the issues that will come with a total chemical ban of PFAS products.²²⁶ It provides an alternative to gradually phase PFAS out without being a detriment to the market for these products.²²⁷

The Essential Use Method is one that would likely change the United States' chemical regulations for the better. The Essential Use Method would categorically define PFAS, and the model could be used for other emerging forever chemicals as well.²²⁸ It would reverse the process of assuming chemicals are safe until deemed hazardous and state that chemicals should be deemed hazardous until proven safe for use.²²⁹ This reversal of the United States' current regulatory scheme for PFAS is needed for substantial change to happen.

V. CONCLUSION

Forever chemicals, like PFAS, are given their name for a reason. These types of chemicals will not disappear quickly and will remain a problem if they are not effectively regulated. PFAS contamination is so prevalent today because previous regulations have failed to confront this decades-long problem. While the United States government has taken some steps toward comprehensive regulation and control of forever chemicals, these attempts have not created a real solution. The

²²⁵ *Id.*

²²⁶ *Id.* at 169.

²²⁷ *Id.*

²²⁸ *Id.* at 163.

²²⁹ *Id.* at 169.

PFAS Action Act is a starting point, but it needs to be supplemented with more restrictive regulations. New regulations should include the entire PFAS family of chemicals, in addition to GenX emerging chemicals, and a strict liability provision for manufacturers. In modeling future regulatory schemes, the United States legislators should look to the Stockholm Convention, the EU, and Denmark for examples of effective protection from PFAS contamination. The Essential Use Model would also be a beneficial model for creating interim policies until a total or more severe ban can be enforced.

To solve the forever chemical crisis, strict regulations and strong legislation are necessary to catalyze a movement to safe alternatives to PFAS. Substance-by-substance approaches are time-consuming and ineffective. A comprehensive scheme utilizing methods from international organizations can effectively speed up the progress of PFAS legislation. Other nations are refusing to accept the problems caused by the inaction by their legislators and government. So too here. The methods proposed may be costly, but they are reasonable considering the extent of the problem the world is facing with forever chemicals. Both globally and nationally, people can no longer ignore the persistence of PFAS in the environment. The proposed regulations will not reverse the damage from PFAS exposure, but by taking a more aggressive approach to PFAS product use, the United States can start to shift focus from restriction to restoration.