

ARTICLES

PATCHING A PERSISTENT PROBLEM: PFAS AND RCRA'S CITIZEN SUIT PROVISION

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SUMMARY

Per- and polyfluoroalkyl substances (PFAS) are a toxic, environmentally persistent class of chemicals that have been used widely in consumer products. Despite growing evidence of adverse health effects associated with PFAS exposure, the U.S. Environmental Protection Agency has not yet promulgated a legally enforceable standard for any of the individual chemicals in the PFAS group. This has resulted in largely unrestricted disposal of PFAS waste and dispersal of these persistent chemicals throughout the environment. This Article presents the legal case for applying §7002(a)(1)(B) of the Resource Conservation and Recovery Act to PFAS waste, and argues that this citizen suit provision has the potential to become a powerful tool to address PFAS in the absence of significant federal regulatory action.

Per- and polyfluoroalkyl substances (PFAS) have become a source of public outrage in recent years after revelations that manufacturers of these chemicals have long known of their potential dangers, but hid this knowledge from the public.¹ In one of the most infamous examples, E.I. du Pont de Nemours & Co. (DuPont) chemical company knowingly disposed of one type of toxic perfluoroalkyl substance for more than 50 years in unlined pits, contaminating the drinking water of more than 100,000 people in Ohio and West Virginia.² The Washington Works case has spurred a class action lawsuit involving 80,000 plaintiffs that settled for \$343 million, a documentary, and a feature film, and has helped focus

public attention on this toxic and environmentally persistent class of chemicals.³

Despite increased public scrutiny, the federal government has been slow to regulate PFAS.⁴ The U.S. Environmental Protection Agency (EPA) has not yet promulgated a legally enforceable standard for any of the more than 4,700 individual chemicals in the PFAS group.⁵ In the absence of formal federal regulation, a handful of states have begun

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1. Sharon Lerner, *3M Knew About the Dangers of PFOA and PFOS Decades Ago, Internal Documents Show*, INTERCEPT, July 31, 2018, <https://theintercept.com/2018/07/31/3m-pfas-minnesota-pfoa-pfos/>.
2. Nathaniel Rich, *The Lawyer Who Became DuPont's Worst Nightmare*, N.Y. TIMES MAG., Jan. 6, 2016, <https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html>.

3. PFAS Project Lab, *Parkersburg, West Virginia*, <https://pfasproject.com/parkersburg-west-virginia/> (last visited Sept. 8, 2020); DARK WATERS (Focus Features 2019) (official movie trailer), <https://www.focusfeatures.com/dark-waters> (last visited Sept. 8, 2020).
4. John Flesher & Ellen Knickmeyer, *EPA Too Slow on Limiting Toxic Chemicals*, *Critics Say*, AP NEWS, Feb. 14, 2019, <https://www.apnews.com/0f53065e7b914c0898001539257de85e>.
5. CENTERS FOR DISEASE CONTROL AND PREVENTION, AN OVERVIEW OF PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES AND INTERIM GUIDANCE FOR CLINICIANS RESPONDING TO PATIENT EXPOSURE CONCERNS 2 (2018), <https://stacks.cdc.gov/view/cdc/77114>; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, TOWARD A NEW COMPREHENSIVE GLOBAL DATABASE OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFASs): SUMMARY REPORT ON UPDATING THE OECD 2007 LIST OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFASs) 6 (2018), [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV-JM-MONO\(2018\)7&doclanguage=en](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV-JM-MONO(2018)7&doclanguage=en); see Order on Consent at 4, In re E.I. du Pont de Nemours & Co., Nos. SDWA-03-2007-0039-DS, SDWA-05-2007-0001 (EPA Nov. 20, 2006), <https://www.epa.gov/sites/production/files/2016-05/documents/sdwadupont06.pdf> ("The available data do not provide a definitive picture of the presence or absence of [perfluorooctanoic acid (PFOA)] effects on human health, and this subject merits further study.").

to regulate PFAS, primarily in drinking water.⁶ Yet few state regulations exist that address PFAS waste, which contaminates soil, groundwater, and other media, despite the growing realization that contamination from PFAS waste is widespread.⁷

The U.S. Congress seemingly designed §7002(a)(1)(B) of the Resource Conservation and Recovery Act (RCRA)⁸ for just this scenario, since it “unleash[es] an army of private attorneys general to force cleanups when the government drags its feet.”⁹ This citizen suit provision permits

any person [to] commence a civil action on his own behalf against any person . . . who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment.¹⁰

While demonstrating an “imminent and substantial endangerment” appears to present a significant burden to a potential plaintiff, courts have interpreted this statutory language liberally, in some cases allowing the statute to “eliminate *any risk* posed by toxic wastes.”¹¹ These broad judicial interpretations suggest that RCRA §7002(a)(1)(B) may present an important stopgap to address PFAS contamination in the absence of significant federal action.¹²

Part I of this Article provides background information regarding PFAS, RCRA, and §7002(a)(1)(B). Part II considers whether PFAS waste may constitute an “imminent and substantial endangerment” under RCRA’s citizen suit provision, despite the absence of a legally enforceable federal standard for these chemicals. Finally, Part III considers the implications of liability under §7002(a)(1)(B), and discusses whether this provision is the appropriate mechanism to address the problem of PFAS waste. Part IV concludes.

I. Background

A. Persistent PFAS

In 1975, University of Rochester physician Donald Taves discovered something new in tests he had run on his own blood.¹³ The full implications of what he found—organic

fluorocompounds—were initially unknown.¹⁴ The puzzle spurred Taves and another researcher, Warren Guy, to test blood samples from residents of five U.S. cities.¹⁵ These researchers discovered that the organic fluorocompounds were ubiquitous in blood samples, and they speculated that the source might be industrial fluorochemicals used in commercial products.¹⁶

Today, testing confirms that Taves and Guy’s suspicions were correct.¹⁷ PFAS are in consumer products, like cookware, food packaging, and stain repellants, and have found their way into the blood of more than 98% of the U.S. population.¹⁸ They have become ubiquitous in the environment and in human blood due to their widespread commercial use and due to their persistence.¹⁹ PFAS have been widely used in manufacturing and industrial applications since the 1940s due to their useful properties, including fire resistance and oil, stain, grease, and water repellency.²⁰ Common applications for PFAS include Teflon coatings, commercial products that resist heat and chemical reactions, stain-resistant carpets and fabrics, water-repellant clothing and fabrics, paper and cardboard food packaging, and firefighting foams.²¹

PFAS are extremely persistent in the environment, with half-lives of up to eight years in the human body.²² This persistence is due to the strength and stability of their carbon-fluorine bonds, which make them resistant to typical environmental degradation processes and extremely mobile in the environment.²³ Thus, the unique chemical

6. See Association of State Drinking Water Administrators, *Per- And Polyfluoroalkyl Substances (PFAS)*, <https://www.asdwa.org/pfas/> (last visited Sept. 8, 2020) (listing state standards).
7. *Id.*; *Mapping the PFAS Contamination Crisis: New Data Shows 2,230 Sites in 49 States*, ENV’T WORKING GROUP, July 20, 2020, https://www.ewg.org/interactive-maps/pfas_contamination/.
8. 42 U.S.C. §§6901-6992k, ELR STAT. RCRA §§1001-11011.
9. *AM Int’l, Inc. v. Datacard Corp.*, 106 F.3d 1342, 1349, 27 ELR 20503 (7th Cir. 1997).
10. 42 U.S.C. §6972(a)(1)(B).
11. *Easler v. Hoechst Celanese Corp.*, No. CIV.A. 7:14-00048-TM, 2014 WL 3868022, at *5 (D.S.C. Aug. 5, 2014) (quotation omitted); *RCRA Imminent and Substantial Endangerment Suits*, LEVENFELD PEARLSTEIN, LLC, Nov. 23, 2012, <https://www.lplegal.com/content/rcra-imminent-and-substantial-endangerment-suits>.
12. See *infra* Part II (discussing whether PFAS waste qualifies as an “imminent and substantial endangerment” under RCRA’s citizen suit provision).
13. Lerner, *supra* note 1.

14. Rebecca Renner, *Piecing Together the Perfluorinated Puzzle*, 77 ANALYTICAL CHEMISTRY 15, 15 (2005).
15. ROBERT BILOTT, EXPOSURE: POISONED WATER, CORPORATE GREED, AND ONE LAWYER’S TWENTY-YEAR BATTLE AGAINST DUPONT 75 (2019).
16. *Id.*
17. See Antonia M. Calafat et al., *Polyfluoroalkyl Chemicals in the U.S. Population: Data From the National Health and Nutrition Examination Survey (NHANES) 2003-2004 and Comparisons With NHANES 1999-2000*, 115 ENV’T HEALTH PERSP. 1596, 1596 (2007) (estimating that the blood of more than 98% of the U.S. population contains PFAS, and linking concentrations in blood to industrial production of PFAS); U.S. EPA, *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas> (last updated Aug. 10, 2020) (stating that industry uses PFAS in a wide range of industrial applications and in the manufacture of consumer goods).
18. Calafat et al., *supra* note 17.
19. See, e.g., Derek Muir et al., *Levels and Trends of Poly- and Perfluoroalkyl Substances in the Arctic Environment—An Update*, 5 EMERGING CONTAMINANTS 240, 240 (2019) (demonstrating that researchers have found PFAS in the water, atmosphere, and wildlife of the Arctic).
20. U.S. EPA, *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 17.
21. *Id.*; U.S. EPA, EMERGING CONTAMINANTS FACT SHEET—PFOS AND PFOA 2 (2014), https://www.wqa.org/Portals/0/Government%20Relations/fact-sheet_contaminant_pfos_pfoa_march2014.pdf.
22. Robert C. Buck et al., *Perfluoroalkyl and Polyfluoroalkyl Substances in the Environment: Terminology, Classification, and Origins*, 7 INTEGRATED ENV’T ASSESSMENT & MGMT. 513, 513 (2011).
23. ASSOCIATION OF STATE AND TERRITORIAL SOLID WASTE MANAGEMENT OFFICIALS, PERFLUORINATED CHEMICALS (PFCs): PERFLUOROCTANOIC ACID (PFOA) & PERFLUOROCTANE SULFONATE (PFOS) 4 (2015), http://astswmo.org/files/policies/Federal_Facilities/2015-08-ASTSWMO-PFCs-IssuePaper-Final.pdf; AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS: DRAFT FOR PUBLIC COMMENT 2 (2018).

properties of PFAS explain their widespread use, persistence, and ubiquity.²⁴

B. The Problems With PFAS

While disagreement remains over the precise level of risk that PFAS pose to public health, there is now consensus that PFAS are toxic and that significant exposure to some PFAS increases the likelihood of a multitude of adverse health effects.²⁵ According to current evidence, diet, dust intake, and air make up approximately 80% of a person's exposure to PFAS on average, with drinking water accounting for about 20% of a person's exposure.²⁶ More research is needed to better understand exposure pathways and health outcomes for individual PFAS.²⁷

Of the more than 4,700 individual chemicals identified in the PFAS group, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are by far the most studied.²⁸ Manufacturers no longer produce PFOA and PFOS in the United States, but still produce these chemicals internationally.²⁹ Industry may also import these chemicals into the United States in consumer goods.³⁰ 3M Co. conducted some of the first studies on the health effects of PFAS in the 1970s and 1980s.³¹ These studies showed that the studied PFAS were acutely toxic in animals, although 3M did not reveal these results to EPA or the public until more than 20 years later.³²

More recent academic research has linked PFAS exposure to a multitude of adverse health effects.³³ While epidemiology studies that have considered the adverse health effects of PFAS are cross-sectional in design and do not conclusively establish causality, the most comprehensive longitudinal evidence for adverse health effects associated with PFAS exposure is from a study of the population living near the West Virginia DuPont Washington Works plant.³⁴ This study identified probable links between PFOA exposure and high cholesterol, thyroid disease, pregnancy-induced hypertension, ulcerative colitis, and kidney and testicular cancer.³⁵

In 2018, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) released a draft toxicological profile for some perfluoroalkyl compounds that analyzed and summarized existing data on the health effects of PFAS exposure.³⁶ ATSDR concluded that PFAS exposure is linked to the following health outcomes: pregnancy-induced hypertension/preeclampsia, liver damage, increases in serum cholesterol, increased risk of thyroid disease, decreased antibody response to vaccines, increased risk of asthma, and increased risk of decreased fertility.³⁷

As part of the toxicological profile, ATSDR also developed minimal risk levels (MRLs) for four PFAS.³⁸ MRLs are levels of exposure not expected to result in adverse health effects.³⁹ The MRLs reveal that very low concentrations of PFAS may be associated with adverse health outcomes.⁴⁰ For example, they correspond to drinking water concentrations for PFOA of 78 parts per trillion (ppt) for adults and 21 ppt for children, and 52 ppt for adults and 14 ppt for children for PFOS.⁴¹ Currently, concentrations of PFOA and PFOS exceed these levels in drinking water serving more than six million Americans, although there is no available data for drinking water serving approximately 100 million Americans, so the full extent of the problem is unknown.⁴² Thus, the environmental persistence and widespread use of PFAS has led to pervasive contamination at levels that are harmful to human health.⁴³

While concerns over PFOA and PFOS have led to their voluntary phaseout in the United States, there are also new concerns over the chemicals used to replace them.⁴⁴ Researchers developed GenX chemicals as an alternative to PFOA in nonstick coatings, and perfluorobutanesulfonic acid (PFBS) as a replacement for PFOS.⁴⁵ On November 14, 2018, EPA released draft toxicity assessments for GenX chemicals and PFBS that revealed that these replacement chemicals are not problem-free.⁴⁶ The draft assessment for GenX chemicals concluded that these chemicals are likely carcinogenic and that toxicity values for GenX chemicals are on the same order of magnitude as toxicity for PFOA and PFOS.⁴⁷ For PFBS, the draft assessment concluded

24. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23, at 1-2.

25. Matthew Thurlow, *Fear and Loathing of PFAS*, A.B.A., Dec. 27, 2018, https://www.americanbar.org/groups/environment_energy_resources/publications/trends/2018-2019/january-february-2019/fear-and-loathing/; AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23, at 4.

26. Maine Department of Environmental Protection, *Per- and Polyfluoroalkyl Substances (PFAS)*, <https://www.maine.gov/dep/spills/topics/pfas/index.html> (last visited Sept. 8, 2020).

27. Elsie Sunderland et al., *A Review of the Pathways of Human Exposure to Poly- and Perfluoroalkyl Substances (PFAS) and Present Understanding of Health Effects*, 29 J. EXPOSURE SCI. & ENV'T EPIDEMIOLOGY 131, 138 (2019); CENTERS FOR DISEASE CONTROL AND PREVENTION, *supra* note 5, at 3.

28. U.S. EPA, *Basic Information on PFAS*, <https://www.epa.gov/pfas/basic-information-pfas> (last updated Dec. 6, 2018); ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, *supra* note 5.

29. U.S. EPA, *Basic Information on PFAS*, *supra* note 28.

30. *Id.*

31. Sunderland et al., *supra* note 27.

32. *Id.*; Lerner, *supra* note 1.

33. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23, at 5-6.

34. *Id.* at 24; Sunderland et al., *supra* note 27, at 139.

35. Sunderland et al., *supra* note 27, at 139.

36. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23.

37. *Id.* at 5-6.

38. ATSDR, *ATSDR's Minimal Risk Levels (MRLs) and Environmental Media Evaluation Guides (EMEGs) for PFAS*, https://www.atsdr.cdc.gov/pfas/mrl_pfas.html (last reviewed June 24, 2020).

39. *Id.*

40. *Id.*

41. *Id.*

42. Sunderland et al., *supra* note 27, at 134. The average PFOA concentration in one public water supply, the Little Hocking water system, was 3,550,000 ppt. *Id.* at 135.

43. *Id.*

44. Buck et al., *supra* note 22; U.S. EPA, FACT SHEET: DRAFT TOXICITY ASSESSMENTS FOR GENX CHEMICALS AND PFBS 1 (2018), https://www.epa.gov/sites/production/files/2018-11/documents/factsheet_pfbx-genx-toxicity_values_11.14.2018.pdf.

45. U.S. EPA, FACT SHEET: DRAFT TOXICITY ASSESSMENTS FOR GENX CHEMICALS AND PFBS, *supra* note 44.

46. Draft Human Health Toxicity Assessments for Hexafluoropropylene Oxide Dimer Acid and Its Ammonium Salt (GenX Chemicals) and for Perfluorobutane Sulfonic Acid (PFBS) and Related Compound Potassium Perfluorobutane Sulfonate, 83 Fed. Reg. 58768, 58770 (Nov. 21, 2018).

47. See U.S. EPA, FACT SHEET: DRAFT TOXICITY ASSESSMENTS FOR GENX CHEMICALS AND PFBS, *supra* note 44 (concluding that the draft chronic oral reference dose for GenX chemicals is 0.00008 milligrams per kilo-

that this chemical has adverse health effects on the thyroid and kidneys, but the data were inadequate to evaluate carcinogenic effects.⁴⁸

EPA is currently working on toxicity assessments for other PFAS, including perfluorobutyric acid (PFBA), perfluorohexane sulfonic acid (PFHxS), perfluorohexanoic acid (PFHxA), perfluorodecanoic acid (PFDA), and perfluorononanoic acid (PFNA).⁴⁹ Although scientists have not yet studied the health effects of each of the more than 4,700 PFAS, the environmental persistence, bioaccumulation, and toxicity of the entire class of PFAS has prompted some researchers to call for a ban on their use.⁵⁰

C. Federal Regulation of PFAS

While EPA has issued health advisories for PFAS, the Agency has stopped short of promulgating enforceable federal standards.⁵¹ In 2002, EPA first acknowledged the potential health risks of PFAS when it published a significant new use rule (SNUR) for 75 PFAS, which requires prior notice and review by EPA for significant new uses of these substances.⁵² EPA later amended the SNUR in 2007 to include 183 additional PFAS.⁵³

In 2009, EPA placed PFOA and PFOS on its drinking water Contaminant Candidate List, which lists unregulated contaminants that may occur in public water systems and that may require regulation under the Safe Drinking Water Act (SDWA).⁵⁴ In 2012, EPA listed PFOA and PFOS as unregulated contaminants under EPA's Third Unregulated Contaminant Monitoring Rule, and required large public water systems to monitor for PFOA, PFOS, and four other PFAS.⁵⁵ One of EPA's most significant actions to date occurred in 2016, when EPA issued a drinking water health advisory for PFOA and PFOS.⁵⁶ Under the health advisory, EPA recommends taking action to reduce exposure when these chemicals are in drinking water above 70

ppt.⁵⁷ However, EPA health advisories are nonregulatory recommendations and are not enforceable.⁵⁸

In the absence of enforceable federal regulations, states, including New Hampshire, New York, and Vermont, have proposed or enacted enforceable standards for PFAS in drinking water at concentrations of 10-20 ppt, across five PFAS.⁵⁹ Other states have enacted notification standards or have adopted health advisories at concentrations lower than the federal 70 ppt standard.⁶⁰ Navigating this growing patchwork of state regulations presents a significant challenge to regulated industries, and uncertainty regarding the federal regulatory environment has slowed cleanup.⁶¹

In February 2019, EPA released a PFAS action plan.⁶² The plan outlines key steps that the Agency aims to take with regard to PFAS.⁶³ Significantly, EPA announced that it had initiated the regulatory development process for listing PFOA and PFOS as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)⁶⁴ hazardous substances using one of the statutory mechanisms available under CERCLA, RCRA, the Toxic Substances Control Act (TSCA),⁶⁵ the Clean Water Act (CWA),⁶⁶ or the Clean Air Act (CAA).⁶⁷ This action would provide EPA with the ability to require responsible parties to mitigate and remediate PFOA and PFOS contamination at the expense of the responsible parties.⁶⁸

However, a CERCLA hazardous substance listing for PFOA and PFOS would not directly address the cleanup of other PFAS, nor would it trigger the classification of PFOA and PFOS as hazardous wastes under RCRA.⁶⁹ In addition, EPA has not committed to regulating PFOA and PFOS as hazardous substances and has not said when it will issue a regulatory determination.⁷⁰ In February 2020, EPA issued

grams per day (mg/kg-day), compared to 0.00002 mg/kg-day for PFOA and PFOS).

48. *Id.* at 2.

49. U.S. EPA, *Research on Per- and Polyfluoroalkyl Substances (PFAS)*, <https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas> (last updated Sept. 1, 2020).

50. U.S. EPA, FACT SHEET: DRAFT TOXICITY ASSESSMENTS FOR GENX CHEMICALS AND PFBS, *supra* note 44, at 1-2; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, *supra* note 5; Sunderland et al., *supra* note 27, at 142.

51. Thomas S. Lee & John Kindschuh, *State-by-State Regulation of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water*, BRYAN CAVE LEIGHTON PAISNER, July 16, 2019, <https://www.bclplaw.com/en-US/thought-leadership/client-alert-state-by-state-regulation-of-per-and.html>.

52. U.S. EPA, *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 17; Perfluoroalkyl Sulfonates; Significant New Use Rule, 67 Fed. Reg. 72854 (Dec. 9, 2002).

53. U.S. EPA, *Risk Management for Per- and Polyfluoroalkyl Substances (PFAS) Under TSCA*, *supra* note 17; Perfluoroalkyl Sulfonates; Significant New Use Rule, 72 Fed. Reg. 57222, 57223 (Oct. 9, 2007).

54. 42 U.S.C. §300g-1(b)(B)(i)(I), ELR STAT. SDWA §1412(b)(B)(i)(I); U.S. EPA, *Contaminant Candidate List 3—CCL 3*, <http://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3> (last updated July 11, 2018).

55. U.S. EPA, *Third Unregulated Contaminant Monitoring Rule*, <https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule> (last updated Dec. 9, 2016); see Monitoring Requirements for Unregulated Contaminants, 40 C.F.R. §141.40 (2017) (requiring testing for PFOA, PFOS, PFNA, PFHxS, PFHxA, and PFBA).

56. Maine Department of Environmental Protection, *supra* note 26.

57. *Id.*

58. CENTERS FOR DISEASE CONTROL AND PREVENTION, *supra* note 5, at 3.

59. See Lee & Kindschuh, *supra* note 51 (listing adopted and pending enforceable state standards for PFAS).

60. *Id.*

61. Lindsay Ann Brown, *United States: PFAS—Growing Regulation and Liabilities for the Regulated Community*, DUANE MORRIS LLP, Aug. 19, 2019, <http://www.mondaq.com/unitedstates/environmental-law/837728/pfasgrowing-regulation-and-liabilities-for-the-regulated-community>; Jeff B. Kray & Sarah J. Wightman, *Contaminants of Emerging Concern: A New Frontier for Hazardous Waste and Drinking Water Regulation*, NAT. RESOURCES & ENV'T, Spring 2018, at 36, 40.

62. U.S. EPA, EPA'S PFAS ACTION PLAN: A SUMMARY OF KEY ACTIONS 1 (2019), https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_factsheet_021319_final_508compliant.pdf.

63. *Id.*; EPA Takes Two Major Steps Under PFAS Action Plan, WASTE360, Sept. 26, 2019, <https://www.waste360.com/public-agencies/epa-takes-two-major-steps-under-pfas-action-plan>.

64. 42 U.S.C. §§9601-9675, ELR STAT. CERCLA §§101-405.

65. 15 U.S.C. §§2601-2692, ELR STAT. TSCA §§2-412.

66. 33 U.S.C. §§1251-1387, ELR STAT. FWPCA §§101-607.

67. U.S. EPA, EPA'S PFAS ACTION PLAN: A SUMMARY OF KEY ACTIONS, *supra* note 62, at 28; 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.

68. ToxStrategies, Inc., *Detailed Impact of EPA's PFAS Action Plan*, <https://toxstrategies.com/detailed-impacts-of-epas-pfas-action-plan/> (last visited Sept. 8, 2020).

69. See CONGRESSIONAL RESEARCH SERVICE, R45986, FEDERAL ROLE IN RESPONDING TO POTENTIAL RISKS OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) 22-23 (2019), <https://fas.org/sgp/crs/misc/R45986.pdf> (discussing the consequences of listing PFOA and PFOS as CERCLA hazardous substances).

70. ENVIRONMENTAL LAW CLINIC, BERKELEY SCHOOL OF LAW, PETITION FOR RULEMAKING: RCRA REGULATION OF WASTES CONTAINING LONG-CHAIN PFAAS AND GENX CHEMICALS 11 (2020).

a program update for the PFAS action plan, which stated that the “agency continue[s] moving forward with the regulatory process for proposing to designate PFOA and PFOS as hazardous substances under CERCLA.”⁷¹ Environmental groups have criticized EPA for dragging its feet on the regulation of PFAS.⁷²

On March 10, 2020, EPA issued preliminary regulatory determinations to regulate PFOA and PFOS in drinking water.⁷³ The preliminary regulatory determinations present EPA’s initial determination that PFOA and PFOS meet the statutory criteria for promulgating legally enforceable standards for the concentration of these contaminants in public water systems pursuant to §1412(b)(1) of the SDWA.⁷⁴ The public submitted more than 11,000 comments during the comment period, which ended on June 10, 2020.⁷⁵ In mid-July, EPA stated that the “agency will review and consider comments received on this action then take the next appropriate steps.”⁷⁶

While establishing legally enforceable standards for PFOA and PFOS in public water systems would be a significant action in regulating these two PFAS, the preliminary regulatory determinations are only the first step in a process that often takes years and requires substantial data and analysis.⁷⁷ For example, it took EPA more than a decade to promulgate an enforceable standard for perchlorate after it initially issued a preliminary regulatory determination for the contaminant.⁷⁸ Thus, the outcome and timing of this process remains uncertain.

On July 27, 2020, in response to a mandate from Congress, EPA published a final PFAS SNUR that requires parties to notify EPA at least 90 days before commencing the manufacture, import, or processing of long-chain perfluoroalkyl carboxylate and perfluoroalkyl sulfonate substances.⁷⁹ When a party notifies EPA of a significant new use for these PFAS, EPA must evaluate the proposed use

and may restrict the proposed use to protect human health and the environment.⁸⁰

Notably, EPA responded to public criticism by dropping anticipated provisions from the final SNUR, included in previous drafts of the rule, that would have allowed importers to avoid enforcement action if their use predated the effective date of the rule, and that would have created a “de minimis” exemption below which notification would not be required.⁸¹ However, EPA issued the rule under its TSCA §5(a) authority, rather than under TSCA §6(a), meaning that the rule only applies to significant new uses that occur after January or December 2015 (depending on the substance); whereas the TSCA §6(a) approach would have applied to both new and preexisting uses of these substances.⁸² While the SNUR provides EPA with an important tool to limit new sources of PFAS, the impact of the SNUR will ultimately depend on how EPA uses its discretion to restrict significant new uses.⁸³

D. The Problem of PFAS Waste

The absence of enforceable federal regulations has resulted in largely unrestricted disposal of PFAS waste, and current disposal methods can spread these persistent chemicals throughout the environment.⁸⁴ Industry frequently disposes of PFAS-containing waste directly into city wastewater systems or the environment.⁸⁵ For example, in Dalton, Georgia, carpet manufacturers discharged PFAS into the local wastewater system.⁸⁶ Since the traditional wastewater treatment process does not remove PFAS, the discharge of PFAS into the Dalton wastewater system resulted in the contamination of wastewater effluent, sewage sludge, composted sewage sludge, sprayfield soils, groundwater, and local water bodies.⁸⁷

In particular, farmers use treated wastewater sludge (biosolids) as an agricultural fertilizer, which can disperse PFAS contamination widely.⁸⁸ Since PFAS are relatively soluble in water and do not remain bound to organic matter, they can leach out of land-applied biosolids and subsequently contaminate groundwater that serves as a drinking water supply.⁸⁹ In one illustrative case, the land application of biosolids resulted in the PFAS contamination of soil, groundwater, surface water, drinking water, and milk at

71. U.S. EPA, EPA PFAS ACTION PLAN: PROGRAM UPDATE 9 (2020).

72. See, e.g., ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 10 (criticizing EPA for its slow response).

73. Announcement of Preliminary Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List, 85 Fed. Reg. 14098 (proposed Mar. 10, 2020) (to be codified at 40 C.F.R. pt. 141).

74. See 42 U.S.C. §300g-1(b)(1)(A) (requiring EPA to promulgate a national primary drinking water regulation for a contaminant when EPA determines that

(i) the contaminant may have an adverse effect on the health of persons; (ii) the contaminant is known to occur or there is a substantial likelihood that the contaminant will occur in public water systems with a frequency and at levels of public health concern; and (iii) in the sole judgment of the Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.

75. News Release, U.S. EPA, EPA Adds New PFAS Treatment Options and Scientific References to Drinking Water Treatability Database (July 15, 2020), <https://www.epa.gov/newsreleases/epa-adds-new-pfas-treatment-options-and-scientific-references-drinking-water>.

76. *Id.*

77. Dianne R. Phillips, *Environmental Protection Agency Extends PFOA/PFOS Comment Deadline to June 10, 2020*, HOLLAND & KNIGHT, Apr. 28, 2020.

78. Dianne R. Phillips, *EPA Proposes Perchlorate Rule After Years of Study*, HOLLAND & KNIGHT, June 10, 2019.

79. Significant New Use Rule: Long-Chain Perfluoroalkyl Carboxylate and Perfluoroalkyl Sulfonate Chemical Substances, 85 Fed. Reg. 45109 (July 27, 2020) (to be codified at 40 C.F.R. pt. 721); Mark N. Duvall & Ryan J. Carra, *After More Than Five Years, EPA Amends PFAS SNURs*, 10 NAT’L L. REV. 197 (2020).

80. See 15 U.S.C. §2604(a) (detailing this process).

81. Stephanie Feingold & Drew Jordan, *EPA Issues Final PFAS Rule Under TSCA*, MORGAN LEWIS, June 29, 2020.

82. *Id.*; compare 15 U.S.C. §2604(a) (applying to significant new uses), with *id.* §2605(a) (applying to new and existing uses).

83. See *id.* §2604(a) (providing EPA with discretion in identifying and restricting significant new uses).

84. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 10.

85. *Id.* at 12.

86. U.S. EPA, Q&As: PERFLUORO-CHEMICAL (PFC) CONTAMINATION IN DALTON, GA 3 (2009), https://archive.epa.gov/pesticides/region4/water/documents/web/pdf/doc_i_qa_pfc_daltonga.pdf.

87. *Id.*; see ERNIE KELLEY & EAMON TWHIG, VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WASTEWATER TREATMENT SLUDGE AND SEPTAGE MANAGEMENT IN VERMONT 54 (2018) (discussing how PFAS are not typically removed during wastewater treatment).

88. See KELLEY & TWHIG, *supra* note 87, at 5 (stating that approximately half of all sludge produced in the United States (about 7.1 million dry tons per year) is treated to biosolids standards and land-applied).

89. *Id.* at 41.

a dairy farm in Maine.⁹⁰ Thus, current disposal methods are inadequate to contain these mobile chemicals and to prevent PFAS contamination.⁹¹

PFAS-containing firefighting foams (aqueous film-forming foams) represent another major source of PFAS waste and contamination.⁹² Firefighters have used these foams during training exercises and to fight fires at military bases, commercial airports, airplane hangars, oil refineries, fire departments, and petrochemical sites.⁹³ This use has resulted in the contamination of soil and groundwater at these sites.⁹⁴ In-situ remediation options for PFAS in soil are only partially effective, and the most effective solution is often to excavate and transport PFAS-contaminated soil to a landfill or incinerator.⁹⁵

Unfortunately, landfilling is an imperfect disposal solution due to the persistence of PFAS.⁹⁶ Since wastewater treatment facilities commonly treat landfill leachate and dispose of this leachate in landfill facilities without removing PFAS, these facilities create a closed loop in which the concentration of PFAS in landfill leachate can significantly increase over time.⁹⁷ Each time that PFAS-contaminated leachate passes through a wastewater treatment plant (WWTP), the plant will emit a portion of these pollutants as effluent to surface waters, resulting in harmful releases to the environment.⁹⁸ In addition, the liner of landfills will eventually fail, resulting in the release of leachate and PFAS into groundwater.⁹⁹ While some nonhazardous waste landfills have stopped accepting PFAS waste due to liability concerns, researchers have frequently detected PFAS in municipal landfills due to the use of PFAS in everyday consumer products.¹⁰⁰

Consequently, landfills represent a major source of PFAS waste that is not properly contained to prevent releases of PFAS into the environment.¹⁰¹ Since the disposal of PFAS waste is easier and cheaper in the United States than in some other countries, companies have also imported PFAS

waste for disposal in the United States.¹⁰² Therefore, the absence of federal regulations regulating PFAS waste not only allows for the improper disposal of this waste, but also compounds the problem of PFAS waste by incentivizing its importation.¹⁰³

E. RCRA

Although RCRA regulates waste disposal in the United States, the Act does not yet explicitly address PFAS waste.¹⁰⁴ Enacted in 1976, RCRA establishes a comprehensive scheme to regulate solid wastes and to regulate hazardous wastes from “cradle-to-grave.”¹⁰⁵ Some of the overarching policy goals of RCRA are to reduce or eliminate the generation of hazardous waste as much as possible and to treat, store, and dispose of generated hazardous waste in ways that minimize threats to human health and the environment.¹⁰⁶ RCRA Subtitle D governs the management of nonhazardous solid waste, including municipal solid waste landfills, while RCRA Subtitle C governs the management of hazardous wastes.¹⁰⁷

EPA calls their Subtitle C regulations “perhaps the most comprehensive regulations EPA has ever developed.”¹⁰⁸ These regulations set criteria for hazardous waste generators, transporters, and treatment, storage, and disposal facilities.¹⁰⁹ RCRA defines “hazardous waste” as any waste that,

because of its quantity, concentration, or physical, chemical, or infectious characteristics may—(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.¹¹⁰

EPA regulations differentiate between “characteristic” and “listed” hazardous wastes.¹¹¹ “Characteristic” hazardous waste must exhibit one of four characteristics: ignit-

90. MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, STONE FARM SAMPLE COLLECTION DATA REPORT SUMMARY 3-6 (2017), <https://kkw.org/wp-content/uploads/2018/02/DEP-Phase-2-study.pdf>.

91. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 11.

92. Sharon Lerner, *The U.S. Military Is Spending Millions to Replace Toxic Firefighting Foam With Toxic Firefighting Foam*, INTERCEPT, Feb. 10, 2018, <https://theintercept.com/2018/02/10/firefighting-foam-aff-pfas-pfoa-epa/>.

93. *Id.*

94. *Id.*; Sharon Lerner, *Poisoning the Well: Toxic Firefighting Foam Has Contaminated U.S. Drinking Water*, INTERCEPT, Dec. 16, 2015, <https://theintercept.com/2015/12/16/toxic-firefighting-foam-has-contaminated-u-s-drinking-water-with-pfcs/>.

95. See INTERSTATE TECHNOLOGY AND REGULATORY COUNCIL, REMEDIATION TECHNOLOGIES AND METHODS FOR PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) 3-4 (2018), https://pfas-1.itrcweb.org/fact_sheets_page/pfas_fact_sheet_remediation_3_15_18.pdf (explaining that in-situ remediation strategies for PFAS in soil are considered “partially demonstrated technologies”).

96. See KELLEY & TWOHIG, *supra* note 87, at 54 (describing why landfilling PFAS waste is problematic).

97. *Id.*

98. *Id.*

99. *Id.*

100. Zongu Wei et al., *Treatment of Per- and Polyfluoroalkyl Substances in Landfill Leachate: Status, Chemistry, and Prospects*, 5 ENV'T SCI.: WATER RSCH. & TECH. 1814, 1815 (2019); INTERSTATE TECHNOLOGY AND REGULATORY COUNCIL, *supra* note 95, at 4.

101. Wei et al., *supra* note 100.

102. Sharon Lerner, *Chemours Is Using the U.S. as an Unregulated Dump for Europe's Toxic GenX Waste*, INTERCEPT, Feb. 1, 2019, <https://theintercept.com/2019/02/01/chemours-genx-north-carolina-netherlands/>; see ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 13 (summarizing the importation of GenX-containing waste to the United States by the Chemours Co.).

103. See *supra* notes 96-102 and accompanying text (describing these problems).

104. See ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 11-13 (petitioning EPA to regulate PFAS waste under RCRA).

105. *Parker v. Scrap Metal Processors, Inc.*, 386 F.3d 993, 1014, 34 ELR 20104 (11th Cir. 2004).

106. See 42 U.S.C. §6902 (“[W]herever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.”).

107. U.S. EPA, RCRA ORIENTATION MANUAL I-4 (2014), <https://www.epa.gov/sites/production/files/2015-07/documents/rom.pdf>.

108. *Id.*

109. U.S. EPA, *Resource Conservation and Recovery Act (RCRA) Overview*, <https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview> (last updated May 26, 2020).

110. 42 U.S.C.A. §6903 (West 2014).

111. 40 C.F.R. §§261.10-.11 (2019).

ability, corrosivity, reactivity, or toxicity.¹¹² Alternatively, “listed” wastes are hazardous wastes that EPA places into four categories, known as the F, K, P, or U lists, if the waste meets one of three criteria.¹¹³ Currently, EPA has not classified any PFAS wastes as “characteristic” or “listed,” despite petitions by environmental groups to do so.¹¹⁴

F. RCRA §7002(a)(1)(B)

Despite the lack of formal regulations for PFAS waste under RCRA, the citizen suit provision of RCRA, §7002(a)(1)(B), may provide a mechanism to address threats posed by this waste.¹¹⁵ Section 7002(a)(1)(B) permits

any person [to] commence a civil action on his own behalf against any person . . . who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment.¹¹⁶

Therefore, to prevail on a §7002(a)(1)(B) suit, a plaintiff must typically prove the following elements: (1) the defendant is a person; (2) the defendant has contributed to the handling, storage, treatment, transportation, or disposal of solid or hazardous waste; and (3) the solid or hazardous waste may present an imminent and substantial endangerment to human health or the environment.¹¹⁷

Additionally, a plaintiff must provide notice of the endangerment to the EPA Administrator, the state in which the alleged endangerment may occur, and the prospective defendant, 90 days before filing a §7002(a)(1)(B) claim.¹¹⁸ Since Congress designed §7002(a)(1)(B) to provide a remedy to private citizens in the case of government inaction, a potential plaintiff may not file a §7002(a)(1)(B) claim if EPA or the relevant state agency is diligently prosecuting the prospective defendant or is proceeding with remedial action at the site under the pertinent sections of RCRA or CERCLA.¹¹⁹ Consequently, §7002(a)(1)(B) serves as a fail-safe to address threats to human health and the environment in the absence of significant action by regulators.¹²⁰

II. Does PFAS Waste Constitute an “Imminent and Substantial Endangerment”?

A. Interpreting RCRA §7002(a)(1)(B) and the Word “May”

While demonstrating an “imminent and substantial endangerment” appears to present a significant burden to a potential plaintiff, broad judicial interpretations of §7002(a)(1)(B) suggest that this statute may be applicable to PFAS waste, despite the lack of any enforceable federal standards for PFAS.¹²¹ RCRA does not define what “may present an imminent and substantial endangerment to health or the environment,” and courts have called the relevant legal standard “quite amorphous and open-ended.”¹²² However, many courts have focused on the word “may” in “*may* present an imminent and substantial endangerment,” which has enabled at least five circuit courts to interpret the statute broadly.¹²³

Courts have generally rejected the proposition that plaintiffs may only invoke §7002(a)(1)(B) in emergency situations.¹²⁴ These courts have found support for this broad interpretation in the legislative history of the statute, which suggests that Congress intended RCRA §7003 (and therefore, under this interpretation, §7002(a)(1)(B)) to give courts the tools to “eliminate any risks posed by toxic waste.”¹²⁵ Under this interpretation, “if an error is to be made in applying the endangerment standard, the error must be made in favor of protecting public health, welfare and the environment.”¹²⁶ Congress purposefully amended the statutory language of §7003 (from which the language of §7002(a)(1)(B) originates) in 1980, by substituting the phrase “may present” for the original 1976 wording “is presenting.”¹²⁷ This suggests that Congress intended for courts to interpret the statute broadly.¹²⁸

This broad interpretation contrasts with the more narrow interpretation adopted by some courts, which requires plaintiffs to demonstrate an “unreasonable” risk of harm to human health or the environment.¹²⁹ Overall, however, courts generally agree that “may” in §7002(a)(1)(B) requires

112. Randolph L. Hill, *An Overview of RCRA: The “Mind-Numbing” Provisions of the Most Complicated Environmental Statute*, 21 ELR 10254 (May 1991), available at <https://elr.info/sites/default/files/articles/21.10254.htm>.

113. *Id.*; see 40 C.F.R. §261.11(a) (1989) (stating the criteria for listing a waste as hazardous).

114. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 15-18; Letter from Public Employees for Environmental Responsibility, to Andrew Wheeler, Administrator, EPA 5-20 (Sept. 19, 2019), Re: Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act Concerning the Regulation of a Class of Wastes Containing Per- and Polyfluoroalkyl Substances, https://www.peer.org/wp-content/uploads/2019/10/9_19_19_PPFAS_RCRA_Petition.pdf.

115. See *infra* Part II (arguing that PFAS waste constitutes an imminent and substantial endangerment under §7002(a)(1)(B)).

116. 42 U.S.C. §6972.

117. I CAROLINE N. BROUN & JAMES T. O'REILLY, RCRA AND SUPERFUND: A PRACTICE GUIDE §5:31 (3d ed. 2019); Aiello v. Town of Brookhaven, 136 F. Supp. 2d 81, 104 (E.D.N.Y. 2001).

118. 42 U.S.C. §6972.

119. *Id.*

120. BROUN & O'REILLY, *supra* note 117, §5:31.

121. Easler v. Hoechst Celanese Corp., No. CIV.A. 7:14-00048-TM, 2014 WL 3868022, at *5 (D.S.C. Aug. 5, 2014) (quotation omitted); *RCRA Imminent and Substantial Endangerment Suits*, *supra* note 11; CENTERS FOR DISEASE CONTROL AND PREVENTION, *supra* note 5.

122. Aiello, 136 F. Supp. 2d at 115; 42 U.S.C. §6972.

123. See, e.g., Interfaith Cmty. Org. v. Honeywell Int'l, Inc., 399 F.3d 248, 258, 35 ELR 20043 (3d Cir. 2005) (“The operative word is ‘may.’”); see *Maine People's All. v. Mallinckrodt, Inc.*, 471 F.3d 277, 288, 37 ELR 20008 (1st Cir. 2006) (listing circuit decisions that have followed this interpretation).

124. *Maine People's All.*, 471 F.3d at 288.

125. S. REP. NO. 98-284, at 59 (1983); *Maine People's All.*, 471 F.3d at 287.

126. *United States v. Conservation Chem. Co.*, 619 F. Supp. 162, 194, 16 ELR 20193 (W.D. Mo. 1985).

127. See *Maine People's All.*, 471 F.3d at 294-95 (examining the legislative history of §7002(a)(1)(B) to support a broad interpretation of the provision).

128. *Id.*

129. See Aiello v. Town of Brookhaven, 136 F. Supp. 2d 81, 115 (E.D.N.Y. 2001) (contrasting other courts' interpretations of the statute with the broad reading adopted by the U.S. Court of Appeals for the Second Circuit); *Davies v. National Coop. Refinery Ass'n*, 963 F. Supp. 990, 997 n.2 (D. Kan. 1997).

a showing of harm to health and the environment that need not be incontrovertible, but that must demonstrate a “reasonable prospect of serious threat to human health or the environment.”¹³⁰ Given these broad judicial interpretations, as well as the growing scientific body of evidence linking PFAS exposure to adverse health effects, plaintiffs may be able to demonstrate that PFAS waste demonstrates a “reasonable prospect” of harm.¹³¹

B. “Imminent and Substantial Endangerment”

In addition to the word “may,” broad judicial interpretations of other words in the statute support the application of §7002(a)(1)(B) to PFAS waste.¹³² Courts have held that an endangerment that is “imminent and substantial” requires a “reasonable prospect of future harm.”¹³³ Thus, “imminent” does not indicate that the endangerment must be “immediate.”¹³⁴ Section 7002(a)(1)(B) applies to both past and present acts, meaning that “the endangerment must be ongoing, but the conduct that created the endangerment need not be.”¹³⁵ Courts have interpreted “substantial” to mean that the endangerment is “serious,” and not “remote in time, completely speculative in nature or de minimis in degree.”¹³⁶

Taken together, courts have consistently held that an “imminent and substantial endangerment” means “a threatened or potential harm and does not require proof of actual harm.”¹³⁷ Thus, although the threat must be present now, “the impact of the threat may not be felt until later.”¹³⁸ The broad temporal dimensions attributed to §7002(a)(1)(B) are vital to the application of §7002(a)(1)(B) to PFAS waste, since the potential symptoms of exposure to PFAS might not present themselves in patients until many years later.¹³⁹ In addition, due to the long-term persistence and mobility of these chemicals, potential plaintiffs can demonstrate that even if the current risk of exposure to PFAS is low, the risk of exposure at some point in the future is “imminent and substantial.”¹⁴⁰

130. *Marrero Hernandez v. Esso Standard Oil Co.* (P.R.), 597 F. Supp. 2d 272, 287 (D.P.R. 2009); *Maine People’s All.*, 471 F.3d at 279.

131. U.S. EPA, *Basic Information on PFAS*, *supra* note 28; AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23, at 25; *see Maine People’s All.*, 471 F.3d at 288 (listing courts that have interpreted §7002(a)(1)(B) broadly).

132. *See infra* notes 133-38 and accompanying text (describing these broad interpretations).

133. *Simsbury-Avon Pres. Club, Inc. v. Metacon Gun Club, Inc.*, 575 F.3d 199, 211, 39 ELR 20173 (2d Cir. 2009); *Maine People’s All.*, 471 F.3d at 296.

134. *Maine People’s All. v. Holtrachem Mfg. Co., LLC*, 211 F. Supp. 2d 237, 247, 32 ELR 20826 (D. Me. 2002).

135. *Connecticut Coastal Fishermen’s Ass’n v. Remington Arms Co.*, 989 F.2d 1305, 1316, 23 ELR 20699 (2d Cir. 1993).

136. *Simsbury-Avon Pres. Club, Inc.*, 575 F.3d at 210; *Holtrachem Mfg. Co., LLC*, 211 F. Supp. 2d at 247 (quotation omitted); *City of Bangor v. Citizens Commc’ns Co.*, 437 F. Supp. 2d 180, 217 (D. Me. 2006).

137. *Simsbury-Avon Pres. Club, Inc.*, 575 F.3d at 211 (quotation omitted); *Dague v. City of Burlington*, 935 F.2d 1343, 1356, 21 ELR 21133 (2d Cir. 1991).

138. *Meghrig v. KFC W., Inc.*, 516 U.S. 479, 486, 26 ELR 20820 (1996).

139. U.S. EPA, *Basic Information on PFAS*, *supra* note 28.

140. Buck et al., *supra* note 22; AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23.

C. Analogizing to EPA’s Use of SDWA §1431

EPA’s response to the most infamous case of PFAS contamination in the United States may help enable suits under §7002(a)(1)(B), by demonstrating that EPA has previously considered PFAS contamination to constitute an imminent and substantial endangerment.¹⁴¹ DuPont disposed of PFOA for more than 50 years, contaminating the drinking water of more than 100,000 people in Ohio and West Virginia near DuPont’s Washington Works facility.¹⁴² In response to this widespread contamination, EPA took one of its most drastic actions to date in 2006, using its authority under SDWA §1431 to order DuPont to test and treat PFOA-contaminated public and private water supplies.¹⁴³ SDWA §1431 grants the EPA Administrator broad powers to take appropriate enforcement action under certain criteria.¹⁴⁴ One of these criteria is that the contaminant “may present an imminent and substantial endangerment to the health of persons”—language that is strikingly similar to RCRA §7002(a)(1)(B).¹⁴⁵

EPA based its imminent and substantial endangerment determination on “its interpretation of animal and human studies, and on the results of environmental sampling and monitoring in the vicinity of the Facility,” although the Agency conceded that “[t]he available data do not provide a definitive picture of the presence or absence of [PFOA] effects on human health, and this subject merits further study.”¹⁴⁶ However, in issuing the order, EPA stated that §1431 “does not require a conclusive finding—that a contaminant has, or definitely will, cause harm.”¹⁴⁷ Rather, EPA determined that concentrations of PFOA at or above 0.50 parts per billion (ppb) in drinking water *may* present an imminent and substantial endangerment to human health, which EPA described as “a precautionary level to reduce exposure.”¹⁴⁸ Plaintiffs may be able to analogize EPA’s broad interpretation of SDWA §1431 to support an action under RCRA §7002(a)(1)(B), by demonstrating that EPA has previously concluded that PFAS contamination presents “an imminent and substantial endangerment.”¹⁴⁹

EPA issued a superseding consent order in 2009 that included a revised action level of 0.40 ppb for PFOA in drinking water, based on new data and a “more advanced

141. Order on Consent, In re E.I. du Pont de Nemours & Co., *supra* note 5, at 1-2.

142. Rich, *supra* note 2.

143. Order on Consent, In re E.I. du Pont de Nemours & Co., *supra* note 5, at 1-2.

144. U.S. EPA, *UPDATED GUIDANCE ON INVOKING EMERGENCY AUTHORITY UNDER SECTION 1431 OF THE SAFE DRINKING WATER ACT 4* (2018) <https://www.epa.gov/sites/production/files/2018-09/documents/updatedguidanceonemergencyauthorityundersection1431sdwa.pdf> (these additional criteria include (1) “A contaminant is present in or likely to enter a [public water system] or [underground sources of drinking water], or that there is a threatened or potential terrorist attack,” and (2) “The appropriate state and local authorities have not acted to protect public health.”).

145. 42 U.S.C.A. §300i (2018); 42 U.S.C. §6972(a)(1)(B) (permitting suits when there is “any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment”).

146. Order on Consent, In re E.I. du Pont de Nemours & Co., *supra* note 5, at 4.

147. *Id.* at 5-6.

148. *Id.* at 6.

149. *Id.*

risk assessment technique” that showed toxic effects on experimental animals.¹⁵⁰ Then in 2017, EPA amended the consent order to a new action level of 0.07 ppb, based “upon current science; changed circumstances; new, site-specific information; and EPA’s issuance of a Lifetime Health Advisory value for PFOA.”¹⁵¹ EPA’s SDWA §1431 action demonstrates that regulators may base an imminent and substantial endangerment determination on the precautionary principle, rather than on a comprehensive scientific understanding of adverse health effects.¹⁵² While some industry groups argue that significant PFAS regulation is premature since scientific understanding of PFAS is still evolving, EPA’s response to the Washington Works case instead reveals the wisdom of taking prompt action to minimize harm to human health, and subsequently adjusting PFAS action levels to reflect advances in scientific research.¹⁵³

D. Relevance of State Standards

Federal case law suggests that enforceable state standards for PFAS are relevant in demonstrating that PFAS waste constitutes an imminent and substantial endangerment under §7002(a)(1)(B).¹⁵⁴ State standards, standing alone, do not generally demonstrate an imminent and substantial endangerment under RCRA.¹⁵⁵ However, conformance with state standards is “relevant and useful” in determining whether contamination constitutes an imminent and substantial endangerment.¹⁵⁶

150. Order on Consent at 5, In re E.I. du Pont de Nemours & Co., Nos. SDWA-03-2009-0127-DS, SDWA-05-2009-0001 (EPA Mar. 10, 2009), <https://www.epa.gov/sites/production/files/2016-05/documents/dupont-finalorder09.pdf>; U.S. EPA, DUPONT AGREES TO LOWER LIMIT OF PFOA IN DRINKING WATER 3 (2009), <https://www.epa.gov/sites/production/files/2016-05/documents/dupont-fs0309.pdf>.

151. First Amendment to Order on Consent at 2-3, In re Chemours Co. & E.I. du Pont de Nemours & Co., Nos. SDWA-03-2009-0127-DS, SDWA-05-2009-0001 (EPA Jan. 5, 2017), <https://www.epa.gov/sites/production/files/2017-08/documents/2017amendedorderdupont.pdf>.

152. *Id.*; Charlotte Epstein, *Precautionary Principle*, ENCYCLOPEDIA BRITANNICA, <https://www.britannica.com/topic/precautionary-principle> (last visited Sept. 8, 2020) (defining the “precautionary principle” as an “approach in policy making that legitimizes the adoption of preventative measures to address potential risks to the public or environment associated with certain activities or policies”).

153. Order on Consent, In re E.I. du Pont de Nemours & Co., *supra* note 150, at 5; First Amendment to Order on Consent, In re Chemours Co. & E.I. du Pont de Nemours & Co., *supra* note 151, at 2-3; Suzanne Yohannan, *Industry Raises Legal Warnings Over ATSDR’s Strict Draft PFAS Findings*, INSIDE EPA, Aug. 28, 2018, <https://insideepa.com/daily-news/industry-raises-legal-warnings-over-atsdrs-strict-draft-pfas-findings>.

154. See Thurlow, *supra* note 25 (discussing enforceable state standards); *Interfaith Cmty. Org. v. Honeywell Int’l, Inc.*, 399 F.3d 248, 261 n.6, 35 ELR 20043 (3d Cir. 2005).

155. See H&H Holding, L.P. v. Lee, No. 12-5433, 2014 WL 958878, at *5 (E.D. Pa. Mar. 6, 2014) (“The RCRA claim relies on evidence that certain soil samples exceeded one of Pennsylvania’s state health standards. This is insufficient to raise a genuine issue of material fact.”); *Honeywell Int’l, Inc.*, 399 F.3d at 261 n.6 (“[S]tate standards do not define a party’s federal liability under RCRA.”).

156. See *Honeywell Int’l, Inc.*, 399 F.3d at 261 n.6 (“[W]e find New Jersey’s standards relevant and useful in determining the existence of an imminent and substantial endangerment.”); Raymond K. Hoxsie Real Est. Tr. v. Exxon Educ. Found., 81 F. Supp. 2d 359, 366, 30 ELR 20308 (D.R.I. 2000) (listing decisions that have found state environmental standards useful in determining whether contamination constitutes an imminent and substantial endangerment).

In one case, *Interfaith Community Organization Inc. v. PPG Industries, Inc.*, environmental groups brought suit under §7002(a)(1)(B) against the owner of a former chrome production facility that generated byproducts including hexavalent chromium.¹⁵⁷ Although regulators already required the owner, PPG Industries, to clean up the site to New Jersey’s 20 parts per million (ppm) standard under a consent judgment with the New Jersey Department of Environmental Protection, environmental groups brought the §7002(a)(1)(B) claim in response to a new risk assessment concluding that hexavalent chromium posed a significant risk to human health at concentrations above 1 ppm.¹⁵⁸ On the federal level, EPA had promulgated an enforceable maximum contaminant level for total chromium under the SDWA in 1991, although the standard did not apply uniquely to hexavalent chromium, the most toxic form.¹⁵⁹

In considering whether it had authority to order PPG to clean up the site to levels under New Jersey’s 20 ppm standard, the district court concluded that the “expansive language” of 42 U.S.C. §6972(a)(1)(B) indicated that it could “order remediation to a standard lower than 20 ppm.”¹⁶⁰ Therefore, the district court rejected PPG’s claim that “courts look to the state standard and do not set their own, new standard.”¹⁶¹ Based in part on this determination, the district court denied PPG’s motion for summary judgment in the case.¹⁶² Thus, *Interfaith Community Organization Inc.* demonstrates that state and federal standards do not definitively determine whether PFAS waste presents an imminent and substantial endangerment.¹⁶³ At the same time, enforceable state standards for PFAS help demonstrate that PFAS pose a danger to human health and the environment.¹⁶⁴

E. Relevance of Federal Standards

In a recent case, *Liebhart v. SPX Corp.*, the U.S. Court of Appeals for the Seventh Circuit held that RCRA §7002(a)(1)(B) does not require a plaintiff to show that contamination exceeds agency standards, a holding that supports the application of §7002(a)(1)(B) to PFAS waste.¹⁶⁵ While RCRA §7002(a)(1)(B) claims typically address RCRA-listed hazardous wastes, the contamination in *Liebhart* concerned polychlorinated biphenyls (PCBs), which, like PFAS, are not a listed hazardous waste.¹⁶⁶ PCBs also share

157. 702 F. Supp. 2d 295, 298 (D.N.J. 2010).

158. *Id.* at 299-300.

159. U.S. EPA, *Chromium in Drinking Water*, <https://www.epa.gov/dwstandard-regulations/chromium-drinking-water> (last updated Jan. 27, 2020).

160. *Interfaith Cmty. Org. Inc.*, 702 F. Supp. 2d at 301.

161. *Id.*

162. *Id.* at 301, 315.

163. *Id.*

164. See Thurlow, *supra* note 25 (discussing regulatory action on the state level).

165. 917 F.3d 952, 959 (7th Cir. 2019).

166. See *Kara Holding Corp. v. Getty Petroleum Mktg., Inc.*, No. 99 CIV. 0275 (RWS), 2004 WL 1811427, at *10 (S.D.N.Y. Aug. 12, 2004) (stating that §7002(a)(1)(B) only applies to RCRA-listed hazardous wastes); U.S. EPA, *Defining Hazardous Waste: Listed, Characteristic, and Mixed Radiological Wastes*, <https://www.epa.gov/hw/defining-hazardous-waste-listed-characteristic-and-mixed-radiological-wastes> (last updated July 16, 2020). TSCA regulates PCBs. 40 C.F.R. §261.8 (2019).

several similar characteristics with PFAS since PCBs are persistent, pervasive, and result in some of the same adverse health effects.¹⁶⁷

In *Liebhart*, plaintiffs (the Liebhartes) brought a §7002(a)(1)(B) claim against the owner of a nearby manufacturing site, alleging that dust from the demolition of a building on the site had contaminated the Liebhartes' property with PCBs.¹⁶⁸ As part of their claim, the Liebhartes introduced expert testimony that "there is no 'safe' level of exposure to PCBs that does not increase the risk of disease."¹⁶⁹ However, the district court rejected this testimony as inadmissible and rejected the RCRA claim, noting that plaintiffs had failed to demonstrate that the concentration of PCBs in the soil exceeded 50 ppm, which it called EPA's general regulatory threshold.¹⁷⁰

On appeal, the Seventh Circuit examined how other circuit courts had construed §7002(a)(1)(B), and decided to follow other circuit decisions in adopting a broad interpretation of the statute.¹⁷¹ Under this broad interpretation, the Seventh Circuit expressly rejected the district court's reasoning that an exceedance of a regulatory standard is necessary to demonstrate an imminent and substantial endangerment.¹⁷² Instead, the court stated, "RCRA does not require that plaintiffs demonstrate contamination above some agency-derived threshold level of concentration. It merely requires that they show that contaminants on the property are seriously dangerous to human health (or will be, given prolonged exposure over time)."¹⁷³

The Seventh Circuit remanded the case with instructions that the district court reevaluate expert testimony regarding the health risks of PCBs to see whether "a substantial and imminent threat to the Liebhartes' health may be present."¹⁷⁴ Plaintiffs seeking to bring a §7002(a)(1)(B) claim for PFAS waste may therefore rely on the language in *Liebhart* to argue that this waste poses an imminent and substantial endangerment despite the absence of any enforceable federal standards.¹⁷⁵

F. Addressing Counterarguments

While *Liebhart* supports the application of §7002(a)(1)(B) to PFAS waste, defendants can still rely on contrary authority to argue that §7002(a)(1)(B) is inapplicable.¹⁷⁶

167. U.S. EPA, *Basic Information on PFAS*, *supra* note 28; U.S. EPA, *Learn About Polychlorinated Biphenyls (PCBs)*, <https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs> (last updated Feb. 6, 2020).

168. *Liebhart v. SPX Corp.*, No. 16-CV-700-JDP, 2018 WL 1583296, at *1 (W.D. Wis. Mar. 30, 2018), *vacated and remanded*, 917 F.3d 952 (7th Cir. 2019).

169. *Id.* at *5.

170. *Id.*; 40 C.F.R. §761.60 (2019); *see Liebhart*, 917 F.3d at 960 (following Second Circuit, U.S. Court of Appeals for the Third Circuit, U.S. Court of Appeals for the Fourth Circuit, U.S. Court of Appeals for the Tenth Circuit, and U.S. Court of Appeals for the Eleventh Circuit interpretations).

171. *Liebhart*, 917 F.3d at 952.

172. *Id.*

173. *Id.*

174. *Id.* at 961.

175. *Id.*; CENTERS FOR DISEASE CONTROL AND PREVENTION, *supra* note 5.

176. *See Price v. U.S. Navy*, 818 F. Supp. 1323, 1325 (S.D. Cal. 1992), *aff'd*, 39 F.3d 1011, 25 ELR 20177 (9th Cir. 1994) (requiring contaminants to be listed as hazardous waste under RCRA).

As noted in *Liebhart*, the U.S. Court of Appeals for the Ninth Circuit has come to an arguably contrary conclusion regarding the application of §7002(a)(1)(B).¹⁷⁷ In *Price v. U.S. Navy*, the Ninth Circuit affirmed a district court ruling that dismissed a §7002(a)(1)(B) claim, based on expert testimony "that for an imminent and substantial endangerment to exist . . . the contaminants must be listed as hazardous waste under RCRA [and] . . . the level of contaminants must be above levels that are considered acceptable by the State."¹⁷⁸ At least one district court has directly incorporated this language into a test to evaluate §7002(a)(1)(B) claims.¹⁷⁹

However, cabining §7002(a)(1)(B) to RCRA-listed hazardous wastes strikes against the plain language of the statute, which applies to "any *solid* or hazardous waste which may present an imminent and substantial endangerment."¹⁸⁰ Thus, by its plain language, §7002(a)(1)(B) applies not only to hazardous waste, but to solid waste.¹⁸¹ Therefore, courts have criticized *Price* for "treat[ing] the experts' testimony as law without examining [its] statutory validity."¹⁸² In addition, the Ninth Circuit in *Price* affirmed without explicitly discussing the district court's interpretation that §7002(a)(1)(B) only applies to contaminants that EPA lists as RCRA hazardous waste and that exceed state standards.¹⁸³ Thus, the §7002(a)(1)(B) requirements in *Price* arguably represent an erroneous strand of federal law that cuts against the express language of the statute.¹⁸⁴

While *Price* may not provide solid footing for defendants facing §7002(a)(1)(B) claims for PFAS waste, defendants may try to distinguish previous §7002(a)(1)(B) claims based on the lack of an enforceable federal standard for PFAS.¹⁸⁵ While *Liebhart* involved PCBs, which are not RCRA-listed hazardous waste, TSCA regulates these contaminants and provides enforceable federal standards.¹⁸⁶ By contrast, drinking water health advisories for PFOA and PFOS are unenforceable, and are conservative standards calculated to offer a margin of protection against adverse health effects to the most sensitive populations: fetuses during pregnancy and breastfed infants.¹⁸⁷ Therefore, defendants may argue

177. *Liebhart*, 917 F.3d at 959.

178. *Id.*; *Price*, 818 F. Supp. at 1325.

179. *See Kara Holding Corp. v. Getty Petroleum Mktg., Inc.*, No. 99 CIV. 0275 (RWS), 2004 WL 1811427, at *10 (S.D.N.Y. Aug. 12, 2004):

In order for there to be an imminent and substantial endangerment under §6972(a)(1)(B): (1) there must be a population at risk, (2) the contaminants must be listed as hazardous waste under RCRA, (3) the level of contaminants must be above levels that are considered acceptable by the State, and (4) there must be a pathway of exposure.

180. 42 U.S.C. §6972 (emphasis added).

181. *Id.*

182. *Interfaith Cmty. Org. v. Honeywell Int'l, Inc.*, 399 F.3d 248, 260, 35 ELR 20043 (3d Cir. 2005); *Liebhart*, 917 F.3d at 959; *Price v. U.S. Navy*, 39 F.3d 1011, 1021, 25 ELR 20177 (9th Cir. 1994).

183. *Honeywell Int'l, Inc.*, 399 F.3d at 260; *see also Liebhart*, 917 F.3d at 959 (declining to follow *Price*).

184. *Honeywell Int'l, Inc.*, 399 F.3d at 260; *Liebhart*, 917 F.3d at 959.

185. *See infra* notes 186-88 and accompanying text (laying out the case for this argument).

186. *See* 40 C.F.R. §761.60 (2019) (stating enforceable federal standards for PCB waste).

187. U.S. EPA, *FACT SHEET: PFOA & PFOS DRINKING WATER HEALTH ADVISORIES 2* (2016), https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf.

that there is no precedent for allowing §7002(a)(1)(B) liability for chemicals without enforceable federal standards, and that federal inaction regarding PFAS demonstrates that the chemicals do not pose an imminent and substantial endangerment.¹⁸⁸

However, this interpretation directly contradicts the purpose of §7002(a)(1)(B), which is to provide a remedy precisely in the case of government inaction.¹⁸⁹ Failing to apply §7002(a)(1)(B) to PFAS waste would also contradict broad judicial interpretations of the statute, which allow courts to apply §7002(a)(1)(B) when a reasonable prospect of harm exists, since a growing body of scientific knowledge demonstrates that PFAS exposure is associated with adverse health effects, including pregnancy-induced hypertension/preeclampsia, liver damage, increases in serum cholesterol, increased risk of thyroid disease, decreased antibody response to vaccines, increased risk of asthma, and an increased risk of decreased fertility.¹⁹⁰ In addition, EPA's use of its SDWA §1431 authority to address PFAS contamination and increasing state regulation of PFAS will make it difficult for defendants to argue that a reasonable prospect of harm from PFAS waste does not exist.¹⁹¹

III. RCRA §7002(a)(1)(B) Liability Going Forward

A. Recent §7002(a)(1)(B) Claims

The early success of two §7002(a)(1)(B) claims may open the floodgates to further PFAS-related claims under §7002(a)(1)(B).¹⁹² In *Tennessee Riverkeeper, Inc. v. 3M Co.*, 3M's Decatur facility generated sludge contaminated with PFOA and PFOS and sent the sludge to the Morris Farm Landfill, resulting in groundwater contamination and the generation of contaminated leachate.¹⁹³ A WWTP accepted this leachate and discharged wastewater containing PFOA, PFOS, and other PFAS to the Tennessee River.¹⁹⁴ None of these operators had limits on the amount of PFAS they could discharge under the applicable operating permits.¹⁹⁵

Tennessee Riverkeeper brought suit against 3M, the landfill operator, and the WWTP operator, seeking a declaratory judgment that defendants had violated RCRA, as well as an injunction requiring defendants to take steps to abate and remediate their ongoing disposal of PFOA, PFOS, and related chemicals.¹⁹⁶ The district court judge concluded that fact issues remained regarding the application of RCRA to the discharged PFAS-containing waste, and denied the defendants' motions to dismiss.¹⁹⁷ As of May 2020, the case was in mediation.¹⁹⁸

In *Little Hocking Water Ass'n v. E.I. du Pont de Nemours & Co.*, Little Hocking, a nonprofit water provider, brought a §7002(a)(1)(B) claim against DuPont for alleged PFOA contamination of its wellfield from operations at DuPont's Washington Works facility.¹⁹⁹ The district court noted the "lenient" standard and "expansive language" of §7002(a)(1)(B), and cited scientific evidence of the harmful effects of PFOA in denying DuPont's motion to dismiss.²⁰⁰ In 2015, DuPont and Little Hocking settled the case for an undisclosed amount.²⁰¹ The early success of these two cases demonstrates that courts are likely to rely on the broad judicial interpretations of §7002(a)(1)(B), opening the door to liability for PFAS waste and potentially spurring future §7002(a)(1)(B) claims.²⁰²

At least two states have also brought §7002(a)(1)(B) claims to address PFAS contamination.²⁰³ In one case, New Mexico sued to compel the U.S. Air Force to clean up groundwater and drinking water contamination stemming from the use of PFAS-containing firefighting foams at Air Force bases.²⁰⁴ The suit was later incorporated into a multi-district litigation comprising approximately 500 cases that involve claims related to these foams.²⁰⁵ In another case, the Michigan Department of Environmental Quality brought a §7002(a)(1)(B) claim against the owner of a former leather tannery that dumped PFAS-containing tannery waste in unlined trenches and lagoons.²⁰⁶ The suit culminated in a consent decree, in which the manufacturer agreed to pay

196. *Id.*

197. *Tennessee Riverkeeper, Inc.*, 234 F. Supp. 3d at 1164.

198. Court Listener, *Tennessee Riverkeeper Inc. v. 3M Company (5:16-cv-01029)*, <https://www.courtlistener.com/docket/4489100/tennessee-riverkeeper-inc-v-3m-company/> (last updated Sept. 3, 2020).

199. 91 F. Supp. 3d 940, 947 (S.D. Ohio 2015).

200. *Id.* at 969-70.

201. Munk & Manahan, *supra* note 192, at 29, 34.

202. *See supra* notes 197-201 and accompanying text (describing this success); Munk & Manahan, *supra* note 192, at 29, 35 ("Until a uniform regulatory approach develops, it is reasonable to expect a surge in the number of private-party actions filed in the face of this emerging public health issue.").

203. *New Mexico v. U.S. Air Force*, No. 6:19-cv-00178 (D.N.M. July 24, 2019); *Michigan Dep't of Env't Quality v. Wolverine World Wide, Inc.*, No. 1:18-cv-00039-ECF (W.D. Mich. Jan. 10, 2018).

204. Amended Complaint at 1-2, *New Mexico v. U.S. Air Force*, No. 6:19-CV-00178 (D.N.M. July 24, 2019); Kendra Chamberlain, *New Mexico Joins Multidistrict Litigation Against Firefighting Foam Manufacturers for PFAS Contamination*, NM POLITICAL REPORT, July 16, 2020, <https://nmpolitical-report.com/2020/07/16/new-mexico-joins-multidistrict-litigation-against-firefighting-foam-manufacturers-for-pfas-contamination/>.

205. Chamberlain, *supra* note 204; *Aqueous Film-Forming Foams (AFFF) Products Liability Litigation MDL No. 2873*, U.S. Dist. Court, Dist. of S.C., <https://www.scd.uscourts.gov/mdl-2873/index.asp>.

206. Complaint for Declaratory and Injunctive Relief at 2, *Michigan Dep't of Env't Quality v. Wolverine World Wide, Inc.*, No. 1:18-cv-00039-ECF (W.D. Mich. Jan. 10, 2018); John Tunison, *Judge Approves Wolverine PFAS Water Settlement*, MLive, <https://www.mlive.com/news/grand-rap->

188. *See* Defendant 3M Co.'s Reply Memorandum in Support of Its Motion to Dismiss at 9-10, *Tennessee Riverkeeper, Inc. v. 3M Co.*, 234 F. Supp. 3d 1153 (N.D. Ala. 2017) (No. 5:16-cv-01029-HGD) (making a similar argument).

189. *See* AM Int'l, Inc. v. Datacard Corp., 106 F.3d 1342, 1349, 27 ELR 20503 (7th Cir. 1997) (explaining how the notice-and-delay requirements of §7002(a)(1)(B) ensure that plaintiffs may only use this section when the government fails to act).

190. *Marrero Hernandez v. Esso Standard Oil Co. (P.R.)*, 597 F. Supp. 2d 272, 287 (D.P.R. 2009); *see also supra* notes 121-38 and accompanying text (describing broad judicial interpretations of the statute); AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, *supra* note 23, at 5-6.

191. *See supra* Part II.

192. *Tennessee Riverkeeper, Inc.*, 234 F. Supp. 3d at 1153; *Little Hocking Water Ass'n, Inc. v. E.I. du Pont de Nemours & Co.*, 91 F. Supp. 3d 940 (S.D. Ohio 2015); *see* Ilene Munk & Kacy Manahan, *Private-Party Actions Are Establishing PFOS and PFOA Liability*, NAT. RESOURCES & ENV'T, Fall 2017, at 29, 35 (predicting a surge in private PFAS-related actions).

193. 234 F. Supp. 3d at 1157.

194. *Id.*

195. First Amended Complaint for Declaratory and Injunctive Relief at 1, 22, *Tennessee Riverkeeper, Inc. v. 3M Co.*, 234 F. Supp. 3d 1153 (N.D. Ala. 2017) (No. 5:16-cv-01029-HGD).

\$69.5 million to address the resulting groundwater and drinking water contamination.²⁰⁷ Thus, both state regulators and nonprofit organizations have successfully used §7002(a)(1)(B) to address PFAS contamination.

B. Implications of RCRA §7002(a)(1)(B) Liability

Opening the door to liability under §7002(a)(1)(B) may have broad repercussions given the pervasiveness of PFAS waste.²⁰⁸ Despite the absence of formal federal regulations for PFAS waste, growing concerns over §7002(a)(1)(B) liability may act to incentivize more careful handling and disposal of this waste.²⁰⁹ For example, some major companies have already instituted internal policies requiring the incineration of PFAS waste.²¹⁰ In addition, some landfills and incinerators have stopped accepting PFAS waste over liability concerns.²¹¹ Yet, despite current attempts to lessen potential future liability for PFAS waste, the ubiquity of PFAS contamination suggests that §7002(a)(1)(B) liability could be significant.²¹² One study of U.S. landfills found that more than 50% of landfills had PFAS present in landfill leachate, while at least 1,398 locations in 49 U.S. states have PFAS contamination, and as many as 110 million Americans may have PFAS in their water.²¹³

Ultimately §7002(a)(1)(B) claims will become a highly fact-dependent inquiry, as judges attempt to discern at what level individual PFAS may present an “imminent and substantial endangerment” and therefore how far liability should extend.²¹⁴ While judges may arguably be ill-equipped to interpret the science and to create de-facto standards for these contaminants, §7002(a)(1)(B) nonetheless provides a much-needed mechanism to address threats to human health and the environment in the absence of enforceable federal standards for PFAS.²¹⁵

C. Needed Federal Action

Ultimately, EPA should address the problem of PFAS waste by listing this waste as hazardous under RCRA.²¹⁶ Although the U.S. House of Representatives recently passed legislation that would require EPA to establish destruction and disposal guidance for PFAS-containing waste, including biosolids, landfill leachate, and firefighting foam, U.S. Senate leadership has shown no interest in taking up the legislation, and President Donald Trump has said that he will veto the measure if it passes the Senate.²¹⁷ However, EPA could act on its own via two primary mechanisms to regulate PFAS under RCRA.²¹⁸ First, given the toxicity of PFAS, EPA could regulate these substances as characteristic wastes by adding them to the list of groundwater contaminants in Table 1 of 40 C.F.R. §261.24.²¹⁹ However, EPA should follow the more effective approach of listing PFAS waste as toxic waste under RCRA.²²⁰

40 C.F.R. §261.11 specifies that EPA shall list a solid waste as a hazardous waste upon determining that (1) the waste exhibits a characteristic of hazardous waste; (2) the waste meets specified standards for toxicity; or (3) the waste contains toxic constituents and is capable of posing a substantial present or potential hazard based on an 11-part test.²²¹ Environmental groups have recently petitioned EPA to list PFAS as hazardous waste, and have presented evidence to demonstrate that PFAS meet this 11-part test.²²²

Given the thousands of PFAS in existence, the most effective approach would be to regulate PFAS as a class or to regulate subclasses of PFAS.²²³ Specifically, EPA should regulate long-chain perfluoroalkyl acids and GenX chemicals as classes due to their environmental persistence, bioaccumulation, and toxicity, although critics argue that there is no widely accepted method to assess toxicity in such a large class-based approach.²²⁴ Yet, current regulations allow the EPA Administrator to “list classes or types of solid waste as hazardous waste if [she] has reason to believe that individual wastes, within the class or type of

[ids/2020/02/judge-approves-wolverine-pfas-water-settlement.html](https://www.eli.org/ids/2020/02/judge-approves-wolverine-pfas-water-settlement.html) (last updated Feb. 19, 2020).

207. Consent Decree at 18, *Michigan Dep’t of Env’t Quality v. Wolverine World Wide, Inc.*, No. 1:18-cv-00039-ECF (W.D. Mich. Feb. 19, 2020); Tunison, *supra* note 206.

208. *See infra* notes 205-11 and accompanying text (discussing these potential repercussions).

209. Telephone Interview with Kevin Harvey, Associate, GHD (Jan. 21, 2019).

210. *Id.*

211. Jenny Wagner & Kyle Bagenstose, *Warminster: Incinerator No Longer Accepting PFAS Waste*, INTELLIGENCER, Aug. 21, 2019, <https://www.theintell.com/news/20190821/warminster-incinerator-no-longer-accepting-pfas-waste>.

212. *See Mapping the PFAS Contamination Crisis: New Data Shows 2,230 Sites in 49 States*, *supra* note 7 (demonstrating the ubiquity of PFAS contamination).

213. *Id.*; Johnnie R. Lang et al., *National Estimate of Per- and Polyfluoroalkyl Substance (PFAS) Release to U.S. Municipal Landfill Leachate*, 51 ENV’T SCI. TECH. 2197 (2017); David Andrews, *Report: Up to 110 Million Americans Could Have PFAS-Contaminated Drinking Water*, ENV’T WORKING GROUP, May 22, 2018, <https://www.ewg.org/research/report-110-million-americans-could-have-pfas-contaminated-drinking-water>.

214. *See Maine People’s All. v. Holtrachem Mfg. Co., LLC*, 211 F. Supp. 2d 237, 247-48, 32 ELR 20826 (D. Me. 2002) (“The Court will review some of the evidence presented at trial to determine whether a risk of injury to the public health or the environment as a result of mercury downriver is sufficiently likely.”).

215. *See Linda Greenhouse, The Supreme Court & Science: A Case in Point*, 147 DAEDALUS 1, 28 (2018) (arguing that judges are generally ill-equipped to decide cases regarding scientific subjects).

216. *See infra* notes 222-25 and accompanying text (describing some of the benefits of regulating PFAS under RCRA).

217. E.A. (Ev) Crunden, *House Passes Sweeping New PFAS Bill With Waste Implications*, WASTE DIVE, Jan. 10, 2020, <https://www.wastedive.com/news/house-bill-HR535-pfas-landfills-waste-stream-contamination/569789/>; Catalina Jaramillo, *Bucks-Montco Group Joins Nationwide Petition to Designate PFAS as Hazardous Waste*, WHY?, Jan. 16, 2020, <https://why.org/articles/bucks-montco-group-joins-nationwide-petition-to-designate-pfas-as-hazardous-waste/>.

218. *See infra* notes 215-17 and accompanying text (describing these two approaches).

219. 40 C.F.R. §261.24 (2019); ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 9, 15.

220. *See* Letter from Public Employees for Environmental Responsibility, *supra* note 114, at 5-20 (advocating this approach); 40 C.F.R. §261.11 (2019).

221. 40 C.F.R. §261.11 (2019).

222. *Id.* §261.24; ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 18-23; Letter from Public Employees for Environmental Responsibility, *supra* note 114, at 5-20.

223. *See* ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 4 (advocating this approach).

224. *Id.* at 17-18; Jane C. Luxton et al., *Regulating PFAS Will Be Harder Than You Think. This Is Why*, PENN. CAPITAL-STAR, Apr. 10, 2019, <https://www.penncapital-star.com/commentary/regulating-pfas-will-be-harder-than-you-think-this-is-why-opinion/>; ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 6-9; Sunderland et al., *supra* note 27, at 142.

waste, typically or frequently are hazardous,” a situation that applies to classes of PFAS.²²⁵

Listing classes of PFAS as hazardous waste under RCRA would allow EPA to regulate these substances from “cradle to grave” to ensure that industry safely handles, processes, and disposes of them.²²⁶ A hazardous waste listing would also provide needed uniformity to regulated industries that continue to contend with a growing patchwork of conflicting state standards.²²⁷ In addition, a hazardous waste listing would require EPA to conduct research and experiments to explore safe disposal methods for PFAS waste, which would help address key remaining uncertainties regarding the destruction of PFAS by incineration and how best to treat landfill leachate for PFAS.²²⁸ Finally, listing PFAS as hazardous waste under RCRA would trigger the automatic designation of these chemicals as “hazardous substances” under CERCLA, which would facilitate the cleanup of existing PFAS-contaminated sites.²²⁹ Thus, while §7002(a)(1)(B) claims provide an important stopgap measure, EPA must act to more comprehensively address the problem of PFAS waste.²³⁰

IV. Conclusion

By including §7002(a)(1)(B) in the Hazardous and Solid Waste Amendments of 1984, Congress foresaw that state and federal agencies may not always respond quickly to environmental hazards.²³¹ Therefore, Congress enabled “any person” to bring a claim on “his own behalf,” and entrusted courts to resolve and mitigate these hazards.²³² Courts have not shied away from this responsibility, interpreting §7002(a)(1)(B) to its full breadth by allowing the statute to go nearly as far as to “eliminate *any risk* posed by toxic wastes.”²³³

These broad judicial interpretations suggest that courts may apply §7002(a)(1)(B) to the problem of PFAS waste despite the lack of enforceable federal standards.²³⁴ Further, growing evidence of the adverse health effects of PFAS, EPA’s prior use of its imminent hazard authority, and the existence of state standards for PFAS support the application of §7002(a)(1)(B) to PFAS waste.²³⁵ Thus, RCRA §7002(a)(1)(B) helps fill the existing void in federal regulation of PFAS.

225. 40 C.F.R. §261.11(b) (2019); ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 4.

226. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 14; Parker v. Scrap Metal Processors, Inc., 386 F.3d 993, 1014, 34 ELR 20104 (11th Cir. 2004).

227. See Thurlow, *supra* note 25 (discussing the patchwork of state regulation); Brown, *supra* note 61.

228. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 15; see ABEL ARKENBOUT, LONG-TERM SAMPLING EMISSION OF PFOS AND PFOA OF A WASTE-TO-ENERGY INCINERATOR 3 (2018) (suggesting that modern incinerators may not fully destroy PFAS even under ideal operating conditions); Rich Thompson, *PFAS: New Efforts to Put the Genie Back in the Bottle*, WASTE DIVE, Sept. 12, 2019, <https://www.wastedive.com/news/pfas-pfoa-new-efforts-to-put-genie-back-in-bottle/562539/>.

229. ENVIRONMENTAL LAW CLINIC, *supra* note 70, at 12 n.45; 42 U.S.C. §9601(14)(C).

230. See *supra* notes 222-25 and accompanying text (describing the benefits of a hazardous waste listing).

231. See *Maine People’s All. v. Mallinckrodt, Inc.*, 471 F.3d 277, 287, 291-92, 37 ELR 20008 (1st Cir. 2006) (discussing the court’s role in addressing environmental hazards when EPA fails to act).

232. *Id.*; 42 U.S.C. §6972(a).

233. *Easler v. Hoechst Celanese Corp.*, No. CIV.A. 7:14-00048-TM, 2014 WL 3868022, at *5 (D.S.C. Aug. 5, 2014) (quotation omitted).

234. See *supra* Part II (discussing the application of §7002(a)(1)(B) to PFAS waste).

235. *Id.*