Unregulated, Uncertain and Ubiquitous: Environmental Pitfalls of PFAS and 1,4-Dioxane

By Oliver Twaddell, George H. Buermann, Joseph J. Welter

As more regulatory bodies—state and federal—adopt guidelines for these contaminants, and as science develops, defense counsel should stand ready for what may already be the next mass tort.

While the United States Environmental Protection Agency (EPA) has historically exercised its regulatory authority over many environmental contaminants, there are also many "emerging contaminants" that are not yet regulated. The EPA defines these emerging contaminants as chemicals or materials that are characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards. These unregulated contaminants, such as per- and polyfluoroalkyl substances (PFAS), and more recently, 1,4-dioxane, have captured the attention of the plaintiffs' bar. The increase in detection of these chemicals in drinking water throughout the country and alleged potential carcinogenic effect on human health (as well as the effect on property values) has catapulted these man made substances onto the national mass tort stage.

Although the PFAS and 1,4- dioxane contaminants have many differences, some of their similarities are denominators for future mass tort litigation. Both are prolific, synthetic chemical compounds that have been commonly used in industry and consumer products, and they are now emerging as contaminants of concern for public health agencies and environmental regulators. These chemicals are extremely persistent and widely distributed in the environment, in part, because of their high stability and lack of degradation qualities.

Studies suggest that essentially the entire population of the United States has been exposed and have some detectable levels of PFAS; 1,4- dioxane is widely prevalent as well. The regulatory and scientific uncertainty about these emerging contaminants, coupled with large-scale disastrous drinking water events such as the one in Flint, Michigan, have created a populace with a heightened awareness and demand for what many perceive as a basic fundamental right to clean and safe drinking water. These circumstances lend themselves well to a coming mass tort flashpoint.

Unregulated, Emerging Contaminants of Concern

The 1996 amendments to the Safe Drinking Water Act (SDWA) requires the EPA once every five years to issue a new list of no more than 30 unregulated contaminants (those with no health-based standards under the SDWA) to be monitored by public water systems. This Unregulated Contaminant Monitoring Rule (UCMR) provides the EPA and other interested parties with scientifically valid data on the occurrence of contaminants in drinking water. *See* EPA, Fact Sheets About Third Unregulated Contaminant Monitoring Rule (UCMR3), and EPA, Fact Sheets About Fourth Unregulated Contaminant Monitoring Rule (USMR4). The UCMR identifies a number of contaminants, but this article will focus on two particular chemicals that have created major rumblings in the environmental and legal communities: PFAS and 1,4- dioxane.

PFAS is attracting nationwide interest partly because the EPA Science Advisory Board recommended that PFOA be classified as a "likely" human carcinogen in 2006. 4- Dioxane has also emerged as a budding contaminant: the EPA considers 1,4- dioxane "a likely human carcinogen."

PFAS—Background and History of the Chemical

PFAS include two compounds that were commonly used in industry and manufacturing for more than 60 years: Perfluorooctanoic acid, C8HF15O2), (PFOA), also known as "C8," and perfluorooctanesulfonic acid, C8HF17O3S, (PFOS). Although production of PFOS still occurs in some Asian countries, by 2002 it was phased out in the United States. The phase out of PFOA was spearheaded in 2006 by the EPA's 2010/2015 PFOA Stewardship Program, whereby the eight major manufacturers of PFAS agreed to commit toward an ultimate goal of eliminating these chemicals from emissions and products by 2015. By 2016, the companies had submitted their final reports stating that they had complied with the EPA's phaseout program.

PFAS have been used extensively in industrial and consumer products. PFOS was once a key material in 3M's Scotch-guard products. Other sources of PFAS include firefighting foams, Teflon, Gore- Tex, Stainsafe, Silverstone, Polartec, and other stain- repellant and surfactant products. They are also used as wetting agents (*i.e*., surfactants) in industrial processes and fluoropolymer production—mostly for Teflon products. Common applications include non-stick cookware; food containers and wrappers; waterproof or stainresistant fabrics, clothing, upholstery, and carpeting; aqueous film-forming foams— fire-fighting agents and foams; engineering coatings; and plastic, rubber. and oil production. *See* EPA, Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS) (May 2016).

PFAS are extremely resistant to degradation in the environment, persisting indefinitely. PFOS also migrates readily from soil to ground water and is highly water-soluble (unlike other well-known persistent and bio- accumulative organic pollutants such as polychlorinated biphenyls (PCBs)). *See* California State Water Resources Control Board, Groundwater Information Sheet. Indeed, from 2006 to 2016, PFOS was detected in about 42 percent of the public water supplies sampled in New Jersey. The concern remains that PFAS contaminate surface water and groundwater used for drinking sources.

In 2012, the EPA added PFOA and PFOS to the Unregulated Contaminant Monitoring Rule. Consequently, public utilities and water systems are required to conduct monitoring to detect their presence in water supplies. PFOA and PFOS are recognized as emerging contaminants of concern primarily because of two characteristics: persistence in the environment and bio-accumulation in the human body. In its report, "Evaluation of Immunotoxicity Associated with Exposure to PFOA and PFOS," the Agency for Toxic Substances and Disease Registry (ATSDR)— a federal public health agency in the U.S. Department of Health and Human Services (DHHS)—observed:

PFOA and PFOS are extremely persistent chemicals that are widely distributed in the environment in part because of high stability and little to no expected degradation in the environment (citations omitted). Once in surface water, apparent half-lives of PFOS and PFOA are 41 and 92 years respectively under typical environmental conditions.

PFAS Health Concerns

The potential human health effects of exposure to PFAS have not been clearly established. The EPA Science Advisory Board recommended that PFOA be classified as a "likely" human carcinogen in 2006. In June 2015, the Agency for Toxic Substances and Disease Registry stated that "test results cannot currently be used to predict health effects, nor can they be linked to specific health problems" and "cannot, in general, be used to specifically predict sources of exposure." The agency's current position on the human health effects of PFAS is that more research is needed because "studies in humans and animals are inconsistent and inconclusive but suggest that certain PFAS may affect a variety of possible endpoints." Although PFAS have been shown to be highly toxic in animal studies, disrupting normal endocrine activity, reducing immune function, and causing adverse effects in organs, human studies have shown limited toxicity.

The C8 Science Panel—a group of independent, public health scientists charged with assessing a *probable link* between PFOA exposure and disease in residents of six West Virginia and Ohio water districts contaminated by PFOA—conducted a large-scale epidemiological study in the affected communities. That research has suggested that exposure to PFOA in drinking water at concentrations of 0.05 parts per billion (ppb) is *probably* linked to (1) kidney cancer; (2) testicular cancer; (3) ulcerative colitis; (4) thyroid disease; (5) high cholesterol; and (6) preeclampsia. "Probable link" for purposes of the C8 study means that it's "more likely than not that among class members a connection exists between PFOA exposure and a particular human disease." Overall, though, it appears that there is no convincing evidence in the scientific literature that exposure to PFOS and PFOA cause cancer in humans. Haley Aldrich, A Primer on Perfluoroalkyl Substances (PFAS)—Emerging Contaminants in Drinking Water, white paper (Oct. 2017). *See also, e.g.,* F.D. Gilliland & J.S. Mandel, Serum *Perfluorooctanoic Acid and Hepatic Enzymes, Lipoproteins, Cholesterol*: *A Study of Occupationally Exposed Men*, Am. J. Indust. Med., 29(5): 60–568 (1996); E.T. Chang *et al., A Critical Review of Perfluorooctanoate and Perfluorooctanesulfonate Exposure and Cancer Risk in Humans*
, Crit. Rev. Toxicol., 46(4): 279–331 (2014).

Pathways of Exposure

Contamination occurs because of runoff, spills, discharge, and migration from industrial facilities where PFAS were manufactured or used at landfills, wastewater treatment plants, and dump sites, and through point-source releases (at firefighting sites, fire-training areas, military bases, airports, and other locations where aqueous film-forming foams were regularly used). PFAS may also end up in the environment as consumer and industrial products containing the compounds break down. People are most likely exposed to PFAS in contaminated food or drinking water, and possibly by using products that contain the chemicals.

Drinking water is a primary exposure source of concern. Contaminated groundwater, well water, and surface water impacts treated drinking water. Groundwater and surface water, carrying PFAS, are sent through municipal water treatment plants to produce drinking water. The treatment process though traditionally does not remove PFAS. A group of Harvard researchers studied occurrence data from the Third Unregulated Contaminant Monitoring Rule (UCMR 3) program (covering the period of 2013 to 2015), and found that "[t]he number of industrial sites that manufacture or use PFASs, the number of military fire training areas, and the number of wastewater treatment plants are all significant predictors of PFAS detection frequencies and concentrations in public water supplies." Hu *et al*., *Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants, Environ. Sci. Technol* . Lett., 3(10): 344–350 (2016). The researchers found that "drinking water supplies for 6 million U.S. residents exceed EPA's lifetime health advisory (70 ng/L) for PFOS and PFOA."

1,4-Dioxane—Background and History of the Chemical

1,4-Dioxane is a synthetic industrial chemical that is completely miscible (mixes in all proportions) in water. *See* EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017). It may migrate rapidly in groundwater ahead of other contaminants and does not volatilize rapidly from surface water bodies. *Id*. The EPA considers 1,4- dioxane "a likely human carcinogen." The EPA also characterizes it as "highly mobile" and not "readily biodegradable." It likely will show up as a contaminant at many sites contaminated with certain chlorinated solvents (particularly 1,1,1- trichloroethane (TCA)) because of its widespread use as a stabilizer for those chemicals. *See id*. The EPA indicates that 1,4- dioxane is used in "paint strippers, dyes, greases, varnishes and waxes." This chemical is also found as an impurity in anti-freeze and aircraft deicing fluid, and in consumer products such as shampoos, deodorants, cleaning detergents, and cosmetics. The EPA estimates that the chemical contaminates drinking water in at least 45 states.

1,4-Dioxane Health Concerns

The EPA has classified 1,4- dioxane as "likely to be carcinogenic to humans" by all routes of exposure. *Id*. (citing EPA, Integrated Risk Information System, "1-4- Dioxane CASRN 123-91-1" (2013)). The DHHS states that 1,4- dioxane is reasonably anticipated to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in experimental animals. EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017). The American Conference of Governmental Industrial Hygienists (ACGIH) has classified 1,4- dioxane as a Group A3 carcinogen— confirmed animal carcinogen with unknown relevance to humans. ACGIH 2011. And the National Institute for Occupational Safety and Health (NIOSH) considers 1,4- dioxane a potential occupational carcinogen. EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017) (citing NIOSH "Dioxane." Pocket Guide to Chemical Hazards (2010).

Pathways of Exposure

Potential human exposure could occur during production and use of 1,4- dioxane as a stabilizer or solvent. EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017) (citing DHHS (2011)). Exposure may occur through inhalation of vapors, ingestion of contaminated food and water, or dermal contact.

EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017) (citing ATSDR (2012) and DHHS (2011)). Inhalation is the most common route of human exposure, and workers at industrial sites are at a greater risk of repeated inhalation exposure. *Id*. (citing ATSDR (2012), and DHHS (2011)). 1,4-Dioxane is readily adsorbed through the lungs and gastrointestinal tract. Some 1,4- dioxane may also pass through the skin, but studies indicate that much of it will evaporate before it is absorbed. Distribution is rapid and uniform in the lung, liver, kidney, spleen, colon, and skeletal muscle tissue. EPA, Technical Fact Sheet, 1,4- Dioxane (Nov. 2017) (citing ATSDR (2012)).

State and Federal Regulatory Framework—PFAS and 1,4-Dioxane

The EPA has monitored PFAS for more than 15 years, but the chemicals are not currently regulated at the federal level (*i.e*., under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Toxic Substances Control Act (TSCA), or the Hazardous Substances Control Act). In 2016, the EPA published a lifetime health advisory, a non-regulatory and unenforceable recommendation, suggesting that the concentration of PFOA and PFOS in drinking water should not be greater than 70 parts per trillion (0.07 ppt). The EPA's lifetime health advisory concentrations do not represent a definitive demarcation between safe and unsafe conditions, but rather, they provide a margin of protection from possible adverse health effects for individuals throughout a lifetime of exposure.

Many of the states with large sites where PFAS has been detected have regulations or advisories, such as maximum contaminant levels (MCL), for drinking water. Alabama, Arizona, California, Massachusetts, Connecticut, and West Virginia have adopted the EPA's lifetime health advisory. In November 2017, New Jersey took the lead in adopting the lowest MCL (0.014 μg/L)(14 ppt) for PFOA in the nation, and the state is currently considering—at the urging of scientists—a strict limit of 0.013 μg/L for PFOS. New Hampshire has a combined level of 0.07 μg/L for the two PFAS contaminants; North Carolina has a level of 2.0 μg/L for PFOA only; Minnesota has 0.3 μg/L for both PFOA and PFOS; and Michigan has adopted 0.011 μg/L for PFOS, and .42 μg/L for PFOA. Other states that have seen PFAS detected on large swaths of their land mass, such as Florida, Pennsylvania, Kentucky, Ohio, Wisconsin, South Dakota, Oklahoma, and Tennessee, have not adopted regulations.

Despite widespread contamination, there is no federal standard (*i.e*., maximum contaminant level) limiting the levels of 1,4- dioxane in tap water. (A maximum contaminant level is not necessary to determine a cleanup level.) OSHA set a general industry workplace exposure limit of 100 ppm based on a time-weighted average (TWA) over an eight-hour workday for airborne exposure to 1,4-dioxane (OSHA 2013). Similarly, the American Conference of Governmental Industrial Hygienists set a threshold limit of 20 ppm based on a TWA over an eight-hour workday for airborne exposure. (ACGIH 2011).

The EPA has included 1,4- dioxane on its SDWA Contaminant Candidate List 3 (CCL3). The CCL 3 is a list of unregulated contaminants that are (1) currently not subject to any proposed or promulgated national primary drinking water regulations; (2) known or anticipated to occur in public water systems; and (3) may require regulation under the SDWA. The list presently contains 104 chemicals, winnowed down from an initial list of approximately 7,500.

Various states have established drinking water and groundwater guidelines for 1,4- dioxane, including Colorado, which has a groundwater quality cleanup standard of 0.35 µg/L (Colo. Dept. Pub. Health & Envt. (2012)); California, which has a notification level of 1 µg/L for drinking water (Cal. Dept. Pub. Health (2011)); New Hampshire, which has a reporting limit of 0.25 µg/L for all public water systems (N.H. Dept. Envtl. Services (2011)); Massachusetts, which has a drinking water guideline level of 0.3 µg/L (Mass. Dept. Envtl. Protection (2012)); Maine, which has a drinking water guideline of 4 ppb; and North Carolina, which has groundwater and surface water supply standards of 3 ppb and 0.35 ppb, respectively.

The State of Litigation

The claims arising from these emerging contaminants come in a few forms: (1) claims by individuals for personal injury, property damage, and cleanup costs arising from discharge in soil or groundwater or both; (2) claims by municipalities for cleanup and costs for cutting-edge filtration devices; (3) public interest group claims related to product contents and level of contamination; (4) public utility company claims that allege water contamination due to improper storage and release from manufacturing processes; and (5) EPA or state government enforcement actions.

The damages sought are widespread, including the cost of remediation, diminution in property values, compensation for personal injuries, costs of bio- monitoring, costs of installation and maintenance of filtration systems, costs of identifying and connecting to a permanent alternate water supply, and costs to investigate, treat, remediate and monitor drinking water. Punitive damages are often sought based on evidence of corporate knowledge of the risk and an alleged malicious failure to warn of the alleged dangers of the contaminant.

1,4-Dioxane Litigation: A Lawsuit by a Public Water Company

In November 2017, we saw the first major lawsuit filed by a public water company for contamination arising from the release of 1,4- dioxane into water supplies. That case was filed in the U.S. District Court for the Eastern District of New York by the Suffolk County Water Authority against major manufacturers for “all necessary funds to reimburse [the authority] for the costs of designing, constructing, installing, operating, and maintaining the treatment facilities and equipment required to remove the 1,4- dioxane from its drinking water wells.” The lawsuit has six causes of action: strict product liability for defective design of the contaminants, strict product liability for failure to warn, negligence, public and private nuisance, and trespass.

This action is notable because it targets deep-pocket manufacturers whose product emits 1,4- dioxane simply as a nominal byproduct in waste water. Due to chemical degradation and dilution of the product in question, the plaintiffs have a very steep hill to climb to prove causation against the manufacturers, as well as to combat the defendant’s traditional, affirmative, product liability defenses. *Suffolk County* Water *Authority v. Dow Chemical Co*., *et al*., 17-cv- 6980 (E.D.N.Y. Nov. 30, 2017). We anticipate additional similar suits on the horizon involving 1,4- dioxane as plaintiffs’ attorney firms ramp up their investigation of the contaminant and its effect on communities and water supplies, developing further evidence on its toxicity and contaminating effects.

PFAS Contamination: Advanced Litigation

The PFAS contamination litigation is more advanced than the 1,4- dioxane litigation. It involves massive settlements, community level plaintiff class action filings, and government plaintiff-led and municipality plaintiff- initiated actions, individual persona injury actions, and filings nationwide.

Massive Settlements

In the last year we've seen major brand manufacturers settle unregulated contaminant lawsuits for hundreds of millions of dollars. The groundbreaking lawsuit in PFAS contamination was filed in 2001 against DuPont—a class action focused on plaintiffs living in proximity to the company's Washington Works plant in West Virginia. The class of plaintiffs sought environmental remediation costs and personal injury damages. Three years later, DuPont reached a $342 million settlement for health research, medical monitoring, and water filtration. And in 2005, DuPont agreed with the C-8 Science Panel conclusion, mentioned above, which determined a "probable link" between PFOA exposure and disease. In 2017, after being hit with large, individual verdicts (a kidney cancer case returned a verdict of $1.6 million, and two testicular cancer cases returned verdicts of $5.6 million and $12.5 million— including a $10.5 million punitive damages award), DuPont settled the PFOA class action for a whopping $671 million for 3,550 claimants. (About half of all claimants claimed either thyroid disease or high cholesterol, 300 claimed ulcerative colitis, 200 claimed preeclampsia, 210 claimed kidney cancer, and 70 claimed testicular cancer.) It appeared that the C-8 Science Panel that DuPont had agreed to in the earlier settlement ultimately provided the impetus for the final resolution.

In 2010, chemical giant 3M—for many decades the main manufacturer of PFAS for firefighting foams, fabric protectors, packaging, and non-stick cookware—was sued by the State of Minnesota, alleging damage to the environment, contaminating drinking water, and harming wildlife and human health as a result PFAS waste disposal. Against allegations that the manufacturer contaminated more than 100 miles of the Mississippi River and had contributed to higher rates of cancer among affected populations, 3M recently settled the lawsuit for $850 million. The settlement will go toward costs associated with cleaning up the contamination and safeguarding drinking water. The manufacturer did not admit liability since it wrestles with more than a dozen other lawsuits across a number of U.S. states.

Class Actions Filed by Communities

Other class actions involving PFAS have been instituted in North Carolina, New York, and Colorado. In August 2016, arguably the most notorious class action involving the contaminant was filed against two manufacturers for 60 years of PFOA contamination from a facility in Hoosick Falls, New York. The plaintiffs include municipalities and private well owners (both alleging direct property damage and nuisance damages), as well as those seeking biomonitoring. Different from the West Virginia litigation, a May 2017 study of Hoosick Falls (pop. 3,500) by New York State found that there was no statistically significant elevation of cancer in the population between 1995 and 2014. In a related 2017 action, a manufacturer that had closed its plant located in North Bennington, Vermont, many years earlier, was sued on allegations of contaminating private drinking water wells with PFAS, including wells across the border in Hoosick Falls, New York. In July 2017, the company agreed to fund a $20 million water line extension for approximately 200 Vermont homes.

Class actions were also filed in September 2016 against major manufacturers and suppliers of aqueous film-forming foams in the U.S. District Court for the District of Colorado, demanding remediation costs and compensation for diminution in value to property and costs for medical monitoring.

Class Actions Involving Reformulated Products

In an effort to avoid PFAS use, some companies sought to develop safer reformulated products. Despite this effort, in 2017, a lawsuit was commenced for medical monitoring arising from the production of a reformulated, alternative PFAS product called GenX, which was released into the Cape Fear River from the company's plant about 100 miles upriver in Fayetteville, North Carolina. The lawsuit claimed that internal company documents described how GenX was "associated with an increased risk of health effects in laboratory animal studies." North Carolina's investigation of Chemours Co.'s use of GenX has apparently resulted in the ceasing of releases of GenX into the river, and water quality is claimed to be within state health goals. (*See* NC Dep't of Environmental Quality).

Government and Municipality Actions

Government entities are equally focused on ensuring that safe drinking water is available to their residents. In early February 2018, apparently piggy backing on DuPont's large class action settlement, Ohio Attorney General Mike DeWine filed suit against the company and its spinoff, the Chemours Company, for the release of PFOA into the Ohio River. The current suit alleges that between 1951 and 2013, DuPont released the chemicals from its Washington Works plant, a 1,200-acre facility, into the Ohio River. We've also seen public water utilities file suits against manufacturers and their chemical suppliers in the U.S. District Court for the Northern District of Alabama. *See The Water Works and Sewer Board of the Town of Centre v. 3M*, No. 13-CV-2017-900049.00 (N.D. Ala. May 15, 2017); *The Water Works and Sewer Board of the Town of Gadsen v. 3M*, No. 4:16-cv-01755 (N.D. Ala. Nov. 2, 2016).

In January 2018, the Michigan Department of Environmental Quality sued a tannery for PFAS contamination, seeking past and future cleanup costs, an order of abatement, and an order to institute long-term, protective measures to mitigate risks to public health, among other forms of relief. *MI Dept. of Env. Quality v. Wolverine World Wide, Inc.*, 1:18-cv-00039 (W.D. Mich. Jan. 10, 2018).

Individual Personal Injury Actions

In February 2018, three wrongful death suits in Michigan were filed against a tannery claiming that PFAS-laced sludge (dumped in nearby farm fields) was responsible for the deaths. Dozens of other lawsuits filed against the manufacturer claim that PFAS exposure in contamination zones led to various diseases and illnesses, including miscarriages, six types of cancer, tumors, and thyroid and kidney problems. Part of the battle in these suits will be between each side's toxicologists fighting over medical causation and the connection between exposure and the alleged ailment or disease that allegedly resulted in death or disease. Notably, one of the doctors who led the C-8 Science Panel commented that the PFAS levels in this Michigan community were much higher than found in West Virginia during their studies.

Action Filings Nationwide

As of March 2018, actions on behalf of individuals and residential classes of plaintiffs have been filed in dozens of other locales where elevated levels of PFAS have been detected—from communities in Massachusetts and Illinois, to communities in Virginia and Texas. And as the lawsuits pile up, precedent and potentially far-reaching decisions are issued that can affect the trajectory of PFAS litigation. For example, on February 20, 2018, a federal court in New York ruled that plaintiffs could seek purely economic damages (lost profits of business) in negligence claims based on PFOA contamination, as long as the plaintiffs, businesses in this instance, have a business that is located within a "zone of contamination."
R.M. Bacon, LLC v. Saint-Gobain Performance Plastics Corp., No. 17-0441, 2018 WL 1010210 (N.D.N.Y Feb. 20, 2018). The court's holding represents a marked expansion of manufacturers' potential liability for environmental contamination in New York: damages are no longer limited to personal injury and property damage; now they include the economic damages of local businesses.

Defending These Matters

There's no "one-size-fits-all" defense. Claims run the gamut from pure environmental to hybrid toxic tort environmental matters. Questions should be asked immediately:

When did the subject release of the contaminant happen? (Is it historical or recent?)

What is the source of the release? (Has it changed over time? Are there multiple sources?)

What was the content of the release?

What operations were involved in the source? (How much did the client's operations contribute to the release, and how much did other entities'?)

How much did others contribute (codefendants or not) to the complained of circumstances?

These are fact- intensive, forensic- centric inquiries that can inform your defense early on in proceedings. And there are cutting- edge ideas that are helping to answer these questions.

Life (and litigation defense) can be made easier when companies take steps to be proactive. One increasingly popular mechanism being used by manufacturers is chemical fingerprinting. What is referred to as a "chemical signature" is placed within a product during the manufacturing process —which serves as a "fingerprint": it makes the product unique without compromising its utility. Chemical fingerprinting helps to isolate one product from another, working to ensure that a manufacturer's product is not confused with another similar product. This can be of critical importance when dealing with multi-source, multiparty contaminant spills or releases involving multiple chemicals. Although this is a rising area of risk management, long-standing defenses such as those implemented in traditional products liability cases should always be explored if implicated. Developing environmental modeling for allocation arguments to shift liability away from your client company, building causation defenses in personal injury matters, and knowing how to attack diminution of value to property claims properly are all tools necessary to build a strong defense against a plaintiff's action or a co- defendants' cross-claims.

Plaintiffs' Attorneys' Business Model

Where do plaintiff's lawyers find the money to fund cleanups? Traditionally, these lawyers focused on point sources (gas stations, leaking USTs, agricultural operations). Similar to the recent Suffolk County Water Authority case discussed above, it is no surprise that we're seeing a new focus on targeting manufacturers of the chemicals that end up in the drinking water supply (and in some instances, manufacturers that incorporate those chemicals into their consumer products). Notably, the traditional, targeted point source defendants often are operated in such a manner that there are no deep pockets and resources are limited. Manufacturers of the chemicals and products, however, have the most knowledge and greatest ability to pay. Therefore, the plaintiffs' bar has been targeting those higher up in the chain, alleging product liability theories, arguing that the risk of the product outweighs its utility, as well alleging as failure-to-warn, negligence, nuisance, and trespass theories.

We anticipate that the plaintiffs' bar will continue to build on this model for their strategy in representing affected public water suppliers and other types of plaintiffs.

What's on the Horizon?

We anticipate more litigation, more laws and government action, regulatory standards reductions in the permissible levels for the contaminants, adoption of action levels, and new remediation techniques.

More Litigation—Unregulated Contaminants Attract Plaintiffs Lawyers

The enormous media attention that's currently being generated, in particular by PFAS, will only increase the persistence and frequency of government action— especially at the state level. What happens with 1,4- dioxane and PFAS—as we're seeing now—will likely be an onslaught of litigation that may or may not be supported by science.

More Laws and Government Action

With increased detection, identification, and public disclosure of contaminated sites and ongoing bio- monitoring programs, not only will more legal actions be filed, but raised awareness will creates incentives for elected officials to address the issues hitting the airwaves. For example, in September 2017, New York Governor Cuomo announced appointees to a Drinking Water Quality Council. The Drinking Water Quality Council will identify strategies to protect New York's drinking water from emerging, federally unregulated contaminants. It will be the Drinking Water Quality Council's duty to review the testing data and science on these chemicals, and provide guidance to the New York State Department of Health on setting maximum contaminant levels for these contaminants.

In late February 2018, the Washington State Senate was contemplating a bill (HB 2658) that would conditionally restrict the use of perflourinated chemicals in food packaging. The law would effectively ban the sale, distribution or use of PFAS chemicals in packaging “that is intended for direct food contact and is comprised, in substantial part, of paper, paperboard, or other materials originally derived from plant fibers.” Also in late February 2018, the California Department of Toxic Substances Control published a rationale for naming carpets and rugs containing PFASs as a “priority product,” (which requires registration and ceasing production or an alternatives analysis), suggesting that the class of chemicals is implicated in “significant or widespread adverse impacts.” California has listed PFOS and PFOA as “developmental toxicants,” which require warnings if the public or workers are exposed to the substances.

Communities will also endeavor to build filtration systems and adopt medical testing programs. Newburgh, New York, for example, built and installed a new, multi-million dollar water filtration system. And tied to New York’s recent Investing in Testing Act—legislation designed to support a five-year study to investigate “safe” levels of PFOS and PFOA in the bloodstream— Newburgh instituted its own blood testing program. Over 2,000 residents have been tested. In Vermont, the legislature enacted a law to allow the state to require companies to fund the extension of public water lines to private residences if a company is found to be responsible for PFOA contamination. *See* Vt. Stat. Ann. tit. 10 §6615e(b) (1) (2017).

On the federal level, at the end of 2017, we saw President Trump sign into law a bill that requires the U.S. Department of Defense to report on its development of a PFAS-free, fire-fighting foam; the EPA also announced its intention to further research PFOA issues. *See* Nat. Defense Auth. Act for Fiscal Year 2018. In May 2018, the EPA plans to convene a summit in Washington D.C. to identify risks associated with PFAS. The EPA also announced that it will be developing and releasing a PFAS-management plan later this year using information from the summit.

We anticipate that bio- monitoring of human exposure, proactive environmental sampling by communities and municipalities, and further advances in science and technology to assess toxicity and fate and transport will continue to be driving factors for more laws and government action. The state and federal efforts described above will be just the tip of the iceberg as science, litigation, and media attention continues to focus on clean water and unregulated contaminants.

Further Reduction and Adoption of Action Levels

The regulatory standards for permissible PFAS levels are shifting downward rapidly. Efforts are underway to encourage states to issue exposure limits that are more stringent than federal standards. Activists and advocates—including plaintiffs’ lawyers— are advocating for amendments to state hazardous substance control statutes to designate PFAS as hazardous substances. Federal and state regulation under the SDWA, by establishment of a maximum contaminant level, may also be on the horizon. While there are no federal drinking water standards for 1,4- dioxane, that lack of regulation is likely to change in the next few years because 1,4- dioxane is one of the first 10 chemicals to be evaluated under revisions to the TSCA, which was amended in 2016. We expect to see a similar trajectory in legislation and regulation of 1,4-dioxane as we’ve seen for PFAS.

New Remediation Techniques

New problems necessitate new solutions. In late February 2018, the Suffolk County Water Authority, discussed above, secured state approval from Albany to use a new technology that is intended to remove 1,4- dioxane from drinking water. The new technology— an ultraviolet reactor—uses ultraviolet light and an oxidizer to break down the chemical. It will be activated at a well site in Central Islip, New York. Regarding PFAS, granulated activated charcoal filtration may be effective at reducing the PFAS concentrations in drinking water. Currently, many treatment strategies lack research support and testing, but one other approach that may be promising is sorption. Sorption is a process of introducing a material (carbon based, resin, and mineral, among others) with PFAS adsorption properties to a contaminated area. The goal of this strategy is to immobilize the PFAS in the soil to prevent them from penetrating groundwater. As demand for PFAS and 1,4- dioxane regulation and litigation increases, so will the development of remediation technologies.

Conclusion: The Plaintiffs' Bar's Sight Is Set on Emerging Contaminants

Emerging contaminants, in particular PFAS, have captivated both sides of the bar. We expect that as more sites are disclosed and more testing is conducted, coupled with the development of health studies focusing on the effects of these prolific manmade chemicals, media and legal attention will remain high. As more regulatory bodies—both state and federal—adopt guidelines for these contaminants, and as science develops, defense counsel should stand ready for what may already be the next mass tort.

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Oliver Twaddell is an associate, and George H. Buermann and Joseph J. Welter are partners, of Goldberg Segalla LLP. Mr. Twaddell handles a range of complex environmental matters, and has experience in both arbitration forums and international litigation. Mr. Buermann advises clients on complex environmental regulatory and compliance matters and litigates environmental matters across the country. Over the past 28 years, Mr. Welter has served as national, regional, and local trial counsel in toxic tort and environmental litigation across the country, including as national science and trial counsel in federal multi-district litigations and state court mass tort programs. Any commentary or opinions do not reflect the opinions of Goldberg Segalla.