THE PAST, PRESENT AND FUTURE OF THE SAFE DRINKING WATER ACT

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The Origins of Drinking Water Protection

Drinking water is one of the few essential requirements for life. Throughout history, human settlements have been built with ready access to sources of safe drinking water. Without this, no population can long remain in place, and it has always been so. The basic task of providing safe water comprises three distinct challenges. A safe source must be identified, the source must be free from contamination (whether through source protection or treatment), and the water must be moved safely to the final point of consumption. To protect the population from waterborne diseases, every one of these tasks must be effectively managed, and each presents its own set of quite difficult technical, policy, and legal challenges. This article focuses on EPA's implementation of the federal legislation in this domain – The Safe Drinking Water Act of 1974 (SDWA).

While the drinking water supply in 21st century America surely faces challenges from algal blooms, lead pipes, nutrient pollution, and other threats, we enjoy some of the safest and most reliable public water in the world. We do not give a second thought when taking a sip from a nearby faucet in Portland, Oregon, or Portland, Maine, in Springfield, Illinois, or Springfield, Missouri. Largely taken for granted, the ubiquity of safe drinking water has not been the case for most of human history. The high levels of cholera, typhoid, dysentery, and other waterborne diseases that were commonplace in times past have thankfully become rare, if not nonexistent, today. Consider that in 1900, an American had a 1 in 20 chance of dying from a gastrointestinal infection before the age of seventy. In 1940, this had been reduced to a 1 in 3,333 chance; and in 1990 to a 1 in 2,000,000 chance. This is a staggering achievement—a 100,000-fold public health improvement in less than a century. SDWA is the latest development in a much longer story.

By the late 1800s, all cities in the United States had some form of public water system (PWS). Many of these relied on sand filtration technologies, where water was mechanically cleansed by percolation. This process, of course, did nothing for bacteria and microorganisms too small to be trapped by the sand particles. The most significant development in drinking water treatment occurred in the early 1900s, with the realization that adding low concentrations of chlorine to water would kill most of the microorganisms. Prior to that time, no municipalities had ever added chemicals to their drinking water supplies. The technical challenge lay in delivery, how best to mix reactive chlorine into large amounts of water. The town of Middelkerke,

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Belgium, installed the first chlorine disinfection system in 1902. Jersey City took the lead in the United States, providing in 1908 the first chlorination of drinking water for an entire city (and was promptly sued).

Easy to apply, inexpensive, and persistent in the water, chlorination gradually took hold. The adoption of chlorinated water was accelerated by the newly created Public Health Service (PHS), which established the nation's first drinking water standards in 1914. There was a good deal of local suspicion and often outright opposition to these PHS standards. While they were binding only on common carriers involved in interstate commerce (such as trains, buses and ferries), the standards had a widespread and immediate impact. Since water was taken on at local depots along the rail lines, for example, national standards indirectly forced all communities providing water to common carriers to chlorinate their water, as well. By 1941, 85 percent of the country's more than five thousand PWS chlorinated their drinking water.

The widespread adoption of chlorinated drinking water meant that water for an entire city could be made safe because of human ingenuity. In an age of technological optimism, municipal chlorination was a heady achievement. It was trendy, "modern" water. It is hard not to appreciate the irony of how this has reversed today, where tap water is seen as pedestrian and bottled water chic.

Typhoid and cholera epidemics were still killing thousands of Americans through the 1920s (the famed aviator, Wilbur Wright, had died of typhoid in 1912), but by the 1950s, even individual cases had become rare. These age-old scourges of waterborne disease, acutely vulnerable to low levels of chlorine, had finally been neutered. It has been claimed that chlorination of drinking water saved more lives than any other technological advance in the history of public health.

The PHS standards were revised in 1925, 1946, and 1962, at which point they covered 28 substances but were purely focused on bacteria and microorganisms. They did nothing to address the recent scientific discoveries highlighting threats posed by chemicals, pesticides, and viruses. Moreover, implementation was surprisingly poor. By 1970, only 650 of the nation's 35,000 PWS had enforcement authority over the standards and only 14 states had adopted PHS standards into law.

In 1970, a Senate committee ordered the PHS to do a careful study of the situation. It was not at all clear that the federal government should legislate in an area that had always been subject to local control. In a politically astute move, the PHS examined drinking water protection in states of the most powerful senators on the committee—969 public systems in the states of Vermont, Colorado, Washington, West Virginia and California. The results were startling. With PHS standards exceeded in over one-third of all samples, the report concluded that 41% of the citizens were drinking "substandard water" and that, nationwide, up to 8 million people were drinking "potentially dangerous water." In Washington state alone, two-thirds of the systems had not tested for chemicals in the past year and only 7 of the 127 systems passed the state's bacteriological standards.

The title of the first Congressional legislation proposed in 1971 to address these problems was the Pure Drinking Water Act. The name was changed in future bills to the Safe Drinking Water Act. Whether the original bill's name was modeled on the Pure Food and Drug Act, the law that gave the federal government authority to regulate foods and medicines, is unclear, but the name change was significant. It made clear that safe drinking water need not be pure – that public drinking water supplies required management of risk rather than elimination of risk.

In the three years between the first version of SDWA and its ultimate passage, legislators debated over what form the law should take. Should funding be provided by the federal and state governments or by rate payers through water bill charges? Should standards be technology or risk-based? How much information should PWS be required to provide consumers about violations? Should PWS be subject to citizen suits for these violations? How far should SDWA's reach extend, to the water treatment plant or further upstream to the water source itself and perhaps even land management practices in the watershed? Should there be a separate Office created in EPA focused on water supply?

While President Nixon had been a strong supporter of early environmental laws such as the Clean Air Act and NEPA, the lack of environmentalist support for his campaign in the 1972 election had convinced him there were no votes to be had by promoting an environmental agenda. Thus he sat on the proposed SDWA. Just months after taking office in 1974, however, President Gerald Ford signed SDWA into law.

The Structure of the Safe Drinking Water Act

The Safe Drinking Water Act is the primary law safeguarding the water we drink. The basic structure of the law can best be understood by answering four basic questions – Who's in and who's out?, What's in and what's out?, Who enforces?, and Who pays?

Through its history, the United States has developed a dauntingly complex array of public water systems. There are now over 150,000 PWS scattered throughout the country, ranging from the Los Angeles utility that serves over 4 million people to the Winterhaven Mobile Estates that serves less than 30 customers. Determining *who's in and who's out*, SDWA covers PWS that regularly provide drinking water to at least 25 people or 15 service connections for at least 60 days per year. While this definition ensures protection for most of the country, it excludes private wells, the primary source of drinking water for about 15% of the country (45 million people) and a large part of rural America's population. The chart below sets out the great variety of PWS in 2015.

Public Water System Type	<=500	501-3,300	3,301-10,000	10,000-100,000	>100,000	Total
Community Water System (e.g., Boston)	27,755	13,517	4,692	3,885	427	**50,546**
Population	4,665,458	19,399,740	28,908,735	110,902,376	139,721,996	303,598,305
Non-Transient Non-CWS (e.g., factory, school)	15,415	2,506	149	17	1	**18,088**
Population	2,150,257	2,674,483	829,469	456,067	203,375	6,313,651
Transient Non-CWS (e.g., gas station)	80,447	2,822	84	13	2	**83,368**
Population	7,236,224	2,660,200	453,342	306,814	2,100,003	12,766,583
Total Systems	**123,617**	**18,845**	**5,195**	**3,915**	**430**	**152,002**
Total Population	**14,041,939**	**24,734,423**	**30,191,543**	**111,675,257**	**142,025,374**	**322,678,539**

Roughly 80% of PWS are small, serving under 500 people. While dominant in terms of number, these small systems serve only 4% of the national population. By contrast, large PWS serving over 100,000 people comprise only 0.2% of the number of systems but serve 44% of the population. As we shall discuss later, with poor access to capital and technical capacity, small PWS face significant challenges complying with SDWA.

While SDWA's concern is ultimately with tap water, part of the law focuses on protecting source waters to ensure that water does not get contaminated in the first place. Thus the Underground Injection Control Program (UIC) regulates wells that inject fluids underground (groundwater accounts for about one-fifth of PWS source water across the country). There is far more underground injection to dispose wastes or recover minerals than people realize, with municipal, agricultural, commercial and industrial entities injecting millions of gallons per year into the over 700,000 wells across the country. In particular, EPA must ensure that injected fluids do not cause a PWS to violate drinking water standards. The 1986 amendments created the Wellhead Protection Program. This is a voluntary program encouraging states to protect the areas around water supply wells from contaminants that threaten groundwater. Importantly, injections from hydraulic fracturing were exempted from SDWA in the 2005 Energy Security Act by what was commonly called the "Halliburton Loophole" because of the role played by Vice President Dick Cheney, former head of Halliburton.

SDWA's authority to protect surface waters is likewise limited. The 1996 amendment required states to create source water assessments, identifying the susceptibility of their PWS to contamination. Each assessment must be made available to the public. The hope is that these findings will spur states and communities to put in place source water protection programs. There is no authority to require action, in large part because land use control has long been jealously guarded as a local government power. As a result, SDWA has no real way to address contamination of source waters from nonpoint pollution such as pesticides and fertilizer. This lack of authority was subject to serious criticism following contamination from algal blooms in Toledo, Ohio. Congress, however, has not expanded SDWA's authority over land use practices that contaminate source waters.

The *what's in and what's out?* challenge concerns which contaminants the law will regulate and which remain outside legal control. EPA is charged to assess the risk posed by contaminants and their likelihood to occur in PWS. Potential contaminants for regulation are first placed on the Contaminant Candidate list. This includes drinking water contaminants that are known or anticipated to occur in PWS but are not subject to SDWA regulations. EPA must issue a new list every five years of up to 30 unregulated contaminants that water systems monitor.

After extensive review, the agency focuses on those posing the greatest risks and may decide to commence the regulatory process of establishing maximum contaminant level goals (MCLGs)—the highest concentration of the contaminant in water that allows an adequate margin of safety. For many contaminants, such as microbes and carcinogens, this number is zero. It may not be practical to eliminate these contaminants, though, so the agency carries out a risk assessment and considers the costs to achieve the mandated reduction. Guided by the mandate that the standard "maximizes health risk reduction benefits at a cost that is justified by the benefits," EPA then sets a maximum contaminant level (MCL). This is the legal standard for the National Primary Drinking Water Regulations (NPDWR), and it is as close to the MCLG as feasible. SDWA is one of the few environmental laws with an explicit cost-benefit analysis requirement.

Put simply, if the presence of a regulated contaminant in a drinking water sample does not exceed the NPDWR, then drinking water from the tap is legally determined to be safe. States can increase the stringency of MCLs, setting even stricter standards. California, in particular, has often done so. The EPA is supposed to periodically reevaluate the stringency of the standards, revising them in light of new data and considering new contaminant candidates to add. After the first decade, EPA had regulated only 23 contaminants and Congress demanded faster progress. In the 1986 amendments, Congress established a schedule requiring EPA to regulate 25 additional contaminants every three years starting in 1991. This led to a rapid increase in MCLs but also pushback to slow down so the agency could be more thorough and strategic. There was particular concern over the costs imposed on smaller water systems with limited ability to raise funds for treatment. Setting standard after standard that exceeded the financial capacity of small water systems created its own problems. Better to ensure that new standards warranted the investments. This would require a more rigorous understanding of the relative costs and risks. The 1996 amendments therefore removed the schedule and required EPA to conduct an analysis of the costs to water suppliers and benefits to public health of proposed MCLs.

The question of *Who Enforces?* is addressed in a similar manner to other federal pollution laws – through cooperative federalism. Under a practice known as "primacy," EPA delegates responsibility to states for primary implementation and enforcement authority. This includes collecting water samples at designated intervals and locations, testing them appropriately, and then enforcing adequately when violations occur. Every state except Wyoming has been granted primacy and receives grants from EPA to help cover program costs. If a system violates EPA/state rules, it is required to notify the public. States report violation and enforcement information to EPA every quarter, which allows EPA to look over primacy states' shoulders to ensure they are following through.

Like other pollution laws, SDWA has a citizen suit provision. "Any person" may file a civil action against a party "alleged to be in violation" of SDWA's provisions or against EPA for failure to perform a nondiscretionary duty. The court may award litigation costs if it deems that appropriate. There has been remarkably little use of the citizen suit provision, orders of magnitude less than under the Clean Air Act or Clean Water Act.

The final structural question for SDWA is *Who Pays?* Robust infrastructure is critical to the provision of safe drinking water but this is expensive to build and maintain. Following the model of the Clean Water Act, the 1996 amendments created the Drinking Water State Revolving Fund (DWSRF). Congress provides grants to states and territories, with the recipients adding a 20% match. States can set aside up to 31% of this amount for specified purposes such as technical assistance to small systems and land acquisition for source water protection. Each state's program uses the remaining capital to make low interest loans for infrastructure projects. The loan is revolving because payments coming in are then lent out as new loans for other projects.

Taken together, SDWA was groundbreaking in three key respects. First, it created *uniform* drinking water standards for a wide range of contaminants that were *enforceable* throughout the country. This may seem like common sense today, but it was a radically original idea, recently introduced in the Clean Air Act of 1970 and Clean Water Act of 1972. Second, it provided badly needed government funds through loans and grants for infrastructure. More times than not, poor water quality was due to lack of resources. Third, it directly engaged the public by making the state of our tap water much more transparent. For the first time, water suppliers were required to send out regular reports on water quality and, perhaps more important, immediately notify customers when serious violations occurred.

With an understanding of SDWA's structure, we now turn to the major challenges EPA has faced in implementing the law and the agency's accomplishments.

Contaminant Coverage

As described above, SDWA's reach extends both to regulated contaminants (through MCLs) and unregulated contaminants (through candidates that may eventually have MCLs). MCLs have been set for over 90 contaminants. This seems a lot, until one realizes that there are more than 85,000 chemicals in use. As described above, Congress was impatient with the pace of determining MCLs in the first decade of SDWA, so it took a much more prescriptive approach in the 1986 amendments (much as it did in the amendments to RCRA two years earlier), and put in place a very ambitious timetable. The amendments provided EPA a list, mandating the agency to establish at least 25 MCLs every three years.

EPA met the requirements and greatly increased the rate of establishing MCLs, but this approach was criticized as rigid and inflexible. Contaminants that may have seemed serious risks in 1986 may not seem so important in light of new knowledge. In the meantime, new contaminants of concern may have emerged such as the pathogen, cryptosporidium that killed scores of people in an outbreak in Milwaukee in 1989. Moreover, such a breakneck pace risked poorly developed MCLs.

As a result, the 1996 amendments returned to EPA both the authority to select which contaminants required MCLs and the appropriate pace of development. Mandatory schedules for MCL development were removed and the economic analysis requirements strengthened. But this, too has been subject to criticism. While EPA has issued a number of revised standards and treatment rules, it has not regulated any new contaminants in drinking water since 1996. In addition, most of the standards have not been revised since being added in the 1970s and 1980s.

This has not been for lack of effort by the EPA. Adding or revising an MCL is onerous and can be controversial. Since many Superfund sites choose MCLs as the basis for the clean-up standards (known as ARARs), the implications of where the standards are set go far beyond the tap. For example, efforts to regulate perchlorate, a chemical that harms the thyroid, commenced in the George W. Bush administration. The Department of Defense was concerned that strict standards for perchlorate in drinking water could greatly increase the cost of Superfund cleanups of the contaminant at their bases. As a result, the Department of Defense made use of the interagency consultation process to push for establishment of a National Academy of Science panel to study the issue. The review both slowed the process and recommended a scientifically valid and less stringent reference dose. EPA is still developing the MCL and has announced its intention to promulgate it in 2019, more than eight years after the process began.

A key point of this story, true not only for SDWA but many of EPA's statutory authorities, is that the agency is often not the only or even the most important decisionmaker in establishing MCLs. Depending on the administration and the issue, other agencies with more political clout or groups within the White House can strongly influence the regulatory process.

The challenge of adopting new MCLs is particularly relevant not only because of newly recognized threats from compounds such as PFOA and PFAS (released from fire-fighting foams and production of Teflon) but the much larger category of what has become known as "emergent contaminants." Evidence has mounted that some chemical contaminants may disrupt the development of humans and animals by fooling our endocrine system. The endocrine system controls the production and release of hormones, the chemical signals that regulate critical aspects of our development and behavior. Endocrine disruptors, a class of synthetic compounds, are able to mimic hormones and potentially interfere with the endocrine system and sexual development. About fifty chemicals have thus far been shown to have the capacity to act as endocrine disruptors. Chemically stable and difficult to remove with conventional drinking water treatment methods, endocrine disruptors' presence in our drinking water and likely impact on human populations are highly disputed.

Levels of pharmaceuticals and personal care products in our drinking water have also caused concern. Millions and millions of people ingest pharmaceutical products every day of the year, drugs treating a dizzying range of conditions from cancer, arthritis, bacterial infections, and hair loss to blood pressure, depression, and high cholesterol. These drugs are specifically designed to change our bodies' chemistry, so their presence in the water we drink has caused alarm in some quarters. And these drugs are surely present in our water. In a widely publicized study, the Associated Press documented the presence of 56 pharmaceuticals or their by–products in treated drinking water, including in the water of metropolitan areas supplying more than forty million people across the nation.

There are no regulations requiring testing for the presence of endocrine disruptors or pharmaceuticals in drinking water or limiting their concentration. The Associated Press study contacted sixty–two major drinking water providers. Twenty–eight of those, just under half, tested for drugs in water. Those not testing included facilities serving some of our nation's largest cities——New York, Houston, Chicago, and Phoenix.

The risk of emergent contaminants may be real, but it is largely unknown. A review of the literature in a peer–review scientific journal was inconclusive. Our scientific progress has created two sorts of problems. The first, seen with endocrine disruptors and pharmaceuticals, is that we are introducing compounds into our environment and drinking water sources that quite literally did not exist decades ago. So how can we assess the unknown? The second problem, ironically, is that our detection capability has dramatically improved. We can now identify traces of pollutants at excruciatingly tiny levels, at parts per trillion and some even at parts per quadrillion. Yet our progress in detection of harmful compounds has not been matched by equal progress in our ability to link the presence of these compounds at very low levels with the actual risks they pose to us.

Risk assessment and management lie at the very core of SDWA's reach. The statute both mandates the agency to act when there is a "meaningful opportunity for health risk reduction" but also to determine whether the benefits of the MCL "justify" the costs. As a result, there is an inescapable degree of uncertainty in setting many of the standards. This was especially clear in the promulgation of arsenic standards.

Arsenic is a naturally occurring chemical, particularly in parts of the Southwest. The PHS set a standard for arsenic in 1942 at 50 ppb. The 1996 amendments required EPA to set an MCL by 2001. Near the end of the Clinton administration, EPA proposed reducing the level to 10ppb.

There was significant pushback to this stricter standard from communities who argued that the costs of compliance would be infeasible for smaller water systems. As one official from Lewiston, Maine, memorably argued during the debate over the 1996 amendments, as a result of compliance with stricter drinking water standards, “We will have the cleanest water in the state and the dumbest kids.” In other words, forcing communities to devote significantly greater resources to treating drinking water would divert funds from arguably more important needs (in this case, from education). This is an example of a risk-risk dilemma, where managing one risk heightens other risks, and is particularly difficult to manage in poor communities.

Concerned over the projected $200 million compliance costs, one of the first acts of the George W. Bush administration was to suspend the more stringent standard. The Bush administration immediately came under intense criticism from not only environmentalists but many Republicans. As the staunchly conservative *Wall Street Journal* thundered, “you may have voted for him, but you didn’t vote for this in your water.” The administration ultimately gave way, sticking with the 10 ppb standard. President Bush later acknowledged that repealing the standard had been a terrible mis-step so early in his presidency.

Looking beyond the awful media coverage, the key point is that the science could not fully answer the challenge of standard setting for arsenic. In the EPA’s analysis for the new regulation, the calculated benefits were extremely uncertain, with estimates ranging from six lives saved through the new standards to one hundred twelve. Cass Sunstein, a law professor and the Obama administration’s chief reviewer of agency regulations, looked carefully at the history of the arsenic regulation and concluded, somewhat with his hands in the air, that “EPA could make many reasonable decisions here, and in the range below 50 parts per billion and above 5 parts per billion, there is no obviously correct choice.”[2]

At a basic level, the problem is that SDWA has addressed the low-hanging fruit. The earlier MCLs addressed contaminants posed clear threats and were relatively easy to detect and treat. Many of the current contaminants, by contrast, are ubiquitous and are present at very low levels. Determining the real risk is very difficult and often requires expensive treatment technologies. None of these challenges is going to get easier.

Compliance and Enforcement

SDWA is designed with multiple redundancies. The local water providers, both public and private, provide the first line of protection. They operate the treatment plant and supervise the infrastructure for water delivery. Because of widespread primacy, the local utilities are supervised by state authorities to ensure compliance with the standards and procedures for sampling and testing. The EPA provides the final check. It determines the water testing schedules and the methods that must be used to ensure compliance. Regional EPA offices look over the shoulders of the state regulators, ensuring adequate compliance monitoring and enforcement. If a contaminant poses an “imminent and substantial endangerment” to human health and the state/local authorities have not acted to protect the health of people, then EPA has emergency authority to step in and take appropriate enforcement action. This authority had been delegated to regional EPA administrators but was revised following the Flint crisis to involve the Office of Enforcement and Compliance Assurance more directly.

[2] Cass Sunstein, *The Arithmetic of Arsenic,* 90 GEORGETOWN L.REV. 2255 (2001)

There is significant noncompliance under SDWA, with violations in 3-10 percent of systems every year. A series of articles in the *New York Times* in 2009 reported that more than 20 percent of the water treatment systems across the country had violated key provisions of SDWA. EPA administrator, Lisa Jackson, acknowledged that "in many parts of the country, the level of significant noncompliance with permitting requirements is unacceptably high and the level of enforcement activity is unacceptably low."[3] A highly publicized 2015 study by NRDC reported 80,834 violations of SDWA, including both health-based violations and monitoring/reporting violations. Violations occurred in all 50 States and all U.S. territories, covering 77 million people, roughly one-quarter of the country's population.

There is disagreement over whether smaller systems suffer greater noncompliance. The NRDC study found that very small systems, such as those in rural and more sparsely populated areas, had a higher percentage of health-based violations. A more recent and peer-reviewed comprehensive study examined 17,900 water systems from 1982-2015. It concluded that violation incidences were much higher in rural than urban areas, but that small systems did not have significantly different rates of violation than larger systems. EPA similarly reported in 2018 the rate of noncompliance did not significantly differ according to the size of the system – 7.1% of the smallest systems had violations compared to 6.7% of the largest systems. Only one-fifth of these systems were persistently in violation, meaning that most of the noncompliant systems changed from year to year.

A key question is why there have been such large numbers of violations. On its face, there is significant compliance and enforcement activity. EPA reports that in 2016, for example, there were almost 60,000 site visits to PWS uncovering 39,580 violations, of which 4,470 (11%) were serious violations. This resulted in 30,478 enforcement actions by EPA and state authorities.

Researchers have suggested that the public nature of most PWS may be an important factor for the noncompliance rates. One large empirical study of the Clean Air Act and SDWA found that public entities were in noncompliance significantly more often than private firms yet were less likely to be penalized for violations.[4] This finding is also consistent with the surprising ineffectiveness of citizen suits.

SDWA's citizen suit provisions are identical to those in the Clean Water Act (CWA). Any citizen may commence a civil action against any person (including the United States) alleged to be in violation of any requirement under the statute. There is a sixty-day notice requirement and the court may award costs of litigation to any party as the court determines appropriate.

During the first four decades of SDWA, there was virtually no litigation under SDWA's citizen suit provision. Indeed, there were only 22 suits over the first 43 years. There has been an increase since the Flint crisis, but the number of suits is startlingly low. Consider that there have been thousands of CWA citizen suits over the same period and the two statutes have the same citizen suit provisions. The same imbalance is also true for Notice of Intent (NOI) to sue the EPA. From 1995-2003, there were only 10 NOI under SDWA compared to 270 under the CWA.[5]

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[3] Charles Duhigg, *Millions in US Drink Dirty Water, Records Show,* New York Times, Dec. 8, 2009.
[4] David Konisky et al., *When Governments Regulate Governments,* 60 AMERICAN JOURNAL OF POLITICAL SCIENCE 559 (July 2016).
[5] James R. May, *Now More Than Ever: Trends in Environmental Citizen Suits at 30,* 10 WIDENER LAW REVIEW 1, 31 (2003).

Both statutes require self-reporting of violations. Indeed, SDWA violations are easier to find than CWA violations. The 1996 amendments required PWS serving over 10,000 people to deliver Consumer Confidence Reports (CCRs) every six months. CCRs provide information on violations of drinking water regulations and contaminant levels. Since the Flint crisis, they must include additional information on corrosion control efforts and lead action level exceedances that require corrective action. This requirement for public self-reporting has been effective. A study of 517 Massachusetts PWS from 1990 to 2003 found that those utilities mailing CCRs directly to their customers reduced total violations by between 30% and 44% and reduced the more severe health violations by 40–57%.[6] Yet it has not driven citizen suits.

Why so few? It doesn't correlate with numbers of government enforcement actions. An average of a citizen suit every two years seems less a case of "The Dog That Didn't Bark" but, rather, "The Case of the Missing Dog."

In speaking with agency officials, environmental groups, and scholars, a number of explanations for the low number of suits have been suggested. The first is the difficulty of suing your own PWS. Often, violations occur because of infrastructure problems that result from inadequate funds. Cash-strapped systems are much more likely to be in noncompliance than better-funded PWS. Lack of resources is more often the driver of noncompliance than malfeasance. If the lawsuit is successful, it will likely mean higher rates to come into compliance. These increases could be particularly significant and challenging for smaller water utilities that cannot easily issue a bond or raise rates. This is in marked contrast to CWA, where citizen suits routinely target private companies.

Part of the answer may lie in the fact that SDWA simply has not been a focus of environmental groups. There is no doubt that SDWA is a neglected statute in law schools. It is rarely covered in environmental law casebooks, rarely taught in courses, and rarely written about by scholars except in passing. Prior to Flint, SDWA received almost no attention in the environmental law community. This was equally true for foundations, who rarely funded drinking water projects. NRDC was the only national environmental group with a significant focus on SDWA prior to Flint.

With few national or local environmental groups funded and focused on drinking water quality, one would expect few citizen suit or lobbying efforts. This stands in marked contrast to the many waterkeeper and other organizations monitoring water quality and litigating under the CWA. This is magnified by the fact that SDWA actions rarely provide for civil penalties against water providers. Without the threat of large fines for noncompliance, PWS are less likely to settle.

Finally, SDWA provides no enforcement mechanism against the sources of contamination. Whether nitrates in agricultural areas or cyanotoxins from algal blooms, SDWA is not designed to get at the real parties to blame for much source water pollution. The drafters of SDWA clearly regarded land use as the domain of local government and (as with the CWA) provided no real power for EPA to address nonpoint source pollution. As a result, it is often more effective to use CWA suits to get at drinking water problems than SDWA.

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[6] Lori Bennear and S. Olmstead, *The impacts of the "right to know": Information disclosure and the violation of drinking water standards*, 56 JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 117 (Sept. 2008).

Flint

One cannot discuss compliance and enforcement without focusing on the tragedy in Flint, Michigan. This event entered the 24/7 national news cycle, led President Obama to visit the city, and has resulted in over a dozen criminal indictments to date. Flint is undoubtedly the most publicized drinking water story in U.S. history and continues to influence SDWA funding and policy decisions.

The origins of the Flint crisis lay in poverty. Located 66 miles northwest of Detroit, Flint was a major auto manufacturing city after World War II, with a population of 100,000 in 1960. As the car jobs went away, Flint followed the sad pattern of other Rust-Belt cities with a declining population and standard of living. By 2015, the city's population had fallen by half. White flight had led to a majority-black city with a 42% poverty rate and one of the worst murder and crime rates in the country. With such a small tax base, the city could not balance its budget. Making use of his executive authority, the Michigan governor appointed an emergency manager in 2011 to supervise the city's operations. The mayor and city council could vote to show their support or displeasure, but they had no authority. In addition to ensuring provision of basic services, the managers were charged with getting cities' books back in order, and that meant cutting costs.

Prior to the 1960s, the city had drawn its drinking water from the local Flint River and the city's treatment plant. Starting in 1967, Flint had bought water from Detroit's utility, piped from Lake Huron 70 miles away. An analysis by the state Department of Treasury persuaded the emergency manager that a large cost saving opportunity, up to $200 million over 25 years, would come from switching sources to the closer Karegnondi Water Authority (KWA), which also drew from Lake Huron. The problem was that a pipeline from the KWA to Flint would take two years to complete. Supported by the city council and mayor, the emergency manager notified the Detroit utility that Flint would switch to the KWA but Detroit made clear that Flint either needed to sign a 30-year contract or lose its water supply in a year.

Looking for an interim source of water, the city made plans to use its original source and turn back to the Flint River for the interim. The Flint water treatment plant had been retired, but the city spent money to bring it quickly back in operation. It was soon apparent that the plant was not immediately up to the task. In late summer of 2014, officials detected the presence of coliform bacteria in the water and issued boil-water advisories. The plant responded with the traditional treatment technique of increasing levels of chlorine. This also increased the water's corrosiveness. SDWA requires water providers to add corrosion inhibiting chemicals that make the water less acidic. The classic inexpensive treatment is with orthophosphate. Over time, a protective layer of the compound can build up, completely blocking the pipe from contact with water. For unknown reasons, however, the water treatment plant failed to add the orthophosphate.

This was particularly harmful in Flint which, like many other cities, contains lead water pipes. Indeed, a Flint city ordinance from 1897 actually *required* that all connections with water mains must be lead pipe. Known as lead service lines, these run water from the large water mains running underneath streets into individual homes. Lead pipe was banned by SDWA in 1986 (though even then, "lead-free" pipe was defined at no more than 8% content). Special rules for managing lead and copper were added in 1991. No one knew how many lead service lines were in Flint or where they were located, but the number was clearly in the thousands. Absent adequate corrosion control, the water in the mains leached lead from the aged service lines, leading to elevated lead levels in the drinking water provided to much of the community.

Lead is a potent neurotoxin. Children are particularly vulnerable because of their rapidly developing brains and nervous systems. As a result of lead's clear dangers, no blood level is considered safe. It is highly regulated across the breadth of environmental law, from the Clean Air Act to RCRA. SDWA's lead and copper rule was adopted in 1991. Because lead levels in drinking water result from lead service lines rather than in water coming from the treatment plant, the lead and copper rule is unlike other MCLs. It mandates that water be tested at the household tap rather than when water leaves the treatment plant. The standard methodology requires that utilities collect samples from household taps that have not been used for six hours. If more than 10% of the samples exceed the action level (15 ppb for lead), certain water treatment steps become mandatory for the PWS. This was not done properly in Flint. It later emerged the Michigan's Department of Environmental Quality (MDEQ) had cherry picked data, leaving out high samples that would have triggered the action level.

Throughout the period that citizens and scientists were raising concerns about elevated lead levels in Flint, MDEQ not only insisted the water was safe to drink but publicly attacked anyone suggesting otherwise. Marc Edwards, the Virginia Tech professor whose fieldwork confirmed the prevalence of high lead levels in drinking water, was denounced by the MDEQ spokesman for "offering broad dire public health advice based on some quick testing [that] could be seen as fanning political flames irresponsibly."

EPA failed to act, as well. A regional EPA staffer wrote a memo raising concerns over the dangers posed by elevated lead levels in the water and shared it with the local resident who had raised concerns about the problem. She shared the memo with the local ACLU office, which published it. The EPA staffer was denounced by MDEQ as "a rogue employee" and reprimanded by the EPA regional office for sharing his memo with a member of the public. It took nearly a year after concerns had first been raised about the quality of Flint's water for a state of emergency to be declared and meaningful actions taken to secure the public health.

The Flint crisis did not happen simply because it had lead service lines. Many cities have lead service lines and provide safe water. In a federalist structure such as SDWA, the system depends on the different levels of government acting well together. It is assumed that information will be shared, that officials act in good faith, and that they have the capacity to act. None of this happened. Indeed Flint represents a massive failure of governance at every level.

Local water plant officials did not add the orthophosphate. They subverted the testing standard. While they claimed to have tested the water in homes with lead service lines and found lead levels acceptable, it later turned out that they did not even know which houses contained lead service lines. In telling residents to run their water a few minutes before taking samples, the officials ensured lead particles would have been flushed out. Monitoring samples that would have triggered the action level were excluded. It seems the local and state officials did everything they could to *avoid* finding high lead levels in their city's water. And the EPA's regional office came under severe criticism for showing too much deference to MDEQ, refusing to step in and take over out of concerns that the agency would be seen as too aggressive and intrusive.

At its very core, though, Flint represents a disturbing example of environmental justice. A FOIA request later uncovered an internal EPA email stating, "I am not so sure Flint is a community we want to go out on a limb for."[7] Imagine that the early events in this story had occurred not in Flint but, instead, in Grosse Point, a wealthy suburb outside of Detroit. Would water supply have proceeded if the plant engineers had protested they were not yet ready? Would widespread reports of rashes, loss of hair, and other ailments from the new drinking water source be dismissed by officials? Would independent reports over high levels of lead in the water be vehemently denied? And would EPA refuse to take a closer look? Or would each of these red flags, and many others, have been addressed and fixed? The resulting mistrust of public officials will take years to restore. Indeed, the question, "how many Flints are out there?", has now become a common query in public drinking water meetings. And, indeed, high lead levels have also been found in the drinking water in Newark and Pittsburgh.

Source Water Protection

An ounce of prevention may be worth a pound of cure. Over one-quarter of the SDWA contaminants enter waters through agricultural nonpoint sources. Out of concern for local land use powers, however, Congress provided EPA little direct authority to protect source waters. Nor does the Clean Water Act provide meaningful authority to regulate this threat.3 The consequences of this have been made clear in a number of drinking water disasters. In 2014, thousands of gallons of an industrial chemical used for treating coal leaked from the Freedom Industries facility in Charleston, West Virginia, down the bank into the Elk River, located just a mile upriver from the intake point for the region's drinking water treatment plant. Residents quickly noticed the licorice smell and a few hours later were officially warned not to drink or cook, wash, or bathe with the water. A state of emergency was declared in nine counties. Schools, hospitals, restaurants, hotels, and more closed. About 300,000 residents were affected. Later that year, a half million residents of Toledo, Ohio, were warned not to drink their water because of a toxin called microcystin caused by an algal bloom from agricultural nutrient runoff.

The 1996 SDWA amendments required states to provide source water assessments for all PWS. The goal was for local communities to use information on potential sources of contamination and vulnerabilities to implement watershed management and risk reduction programs. There is no dedicated source of funding for these activities, however, and much remains to be done. As EPA describes on its website, its role is to "provide information and encourage partnerships for source water protection planning." As a result, USDA and OSHA have arguably done more for source water protection than SDWA.

In a creative 2015 lawsuit, the Des Moines Water Works sued thirteen drainage districts in Iowa for operating without appropriate Clean Water Act discharge permits and for the injuries suffered from having to remove high levels of nitrates from source waters. The case was dismissed in 2017, with the court finding that the drainage districts had unqualified immunity from damage claims and injunctive relief, and that the drainage districts had no power to redress the Water Works' injuries.[8] Notably, the lawsuit did not have any SDWA claims.

A waiver provision in the Surface Water Treatment Rule of the 1986 amendments has provided a clever approach for source protection in a small number of cases. The rule required treatment of surface water sources for large PWS. Filtration could be avoided, however, if a watershed control program minimized microbial contamination of the source waters. New York

[7] http://flintwaterstudy.org/2016/page/3/
[8] Des Moines Water Works v. Sac County, 2017 WL 1042072 (N.D. Iowa 2017)

City estimated it would cost $3-$6 billion to build a treatment plant. Taking advantage of this waiver, this city instead negotiated a comprehensive Memorandum of Agreement with communities in the Catskills and Delaware watersheds, the distant sources where water is pumped to the City. The agreement provided for acquisition of environmentally-sensitive lands, strong watershed rules, and a comprehensive protection program. The first waiver was granted in 1993 and has been regularly renewed ever since. By investing in "green infrastructure" rather than the "grey infrastructure" of a treatment plant, New York City found a less-costly protection strategy that had major conservation benefits. This case has become the classic example of payments for ecosystem services.

Infrastructure Funding

From ancient Rome through today, safe drinking water begins and ends with infrastructure. And the nation's infrastructure is massive. Water needs to be moved from the more than 75,000 reservoirs and rivers to treatment plants and then to our faucets. These built structures and over two million miles of buried pipes never inspire a second's thought on the part of the public until they fail. Such willful ignorance creates a real problem, however, because our nation's water infrastructure has become increasingly enfeebled. While a rough measure, every two minutes a major water line bursts in the United States. It may be in Topeka, Kansas, or Tucumcari, New Mexico. In our nation's capital, Washington, D.C., the rate is about one pipe break a day. The massive pipes that supply New York City are leaking thirty-six million gallons per day. Engineers fear that their structural integrity has become so compromised that draining the pipes for repair would cause them to buckle and collapse under the weight of the soil on top. Overall, roughly 16% of the nation's piped water is lost from leaks and system inefficiencies, seven billion gallons of treated water every day.

The cause in all these cases is the same: inadequate investment in our pipes and treatment plants. Some of our water and sewer lines date from the Civil War. Most were built by our grandfather's and great-grandfather's generations.

Despite the obvious importance of water infrastructure, gaining funding to rebuild our water and sewer lines has proven elusive. We are starving our water system of funds, and have been doing so for years. Part of the reason is the invisibility of the water system, part is the lack of public understanding over how antiquated our infrastructure has become, and part is the refusal to pay for what the system really costs. Perhaps the failure to invest in infrastructure should not be surprising. These arteries and veins of our water system are invisible, buried beneath roads, fields, and buildings. The only time we think about them is when they fail. And the sums required to remedy the decades of underfunding are massive. It costs about $200 per foot of replacement pipe, $1 million every mile. New York City's Third Water Tunnel, currently scheduled for completion in 2020, will span more than sixty miles and meet the growing water demands of more than nine million area residents, but it comes with a six-billion-dollar price tag. The EPA estimates we need $335 billion simply to maintain our drinking water systems. To be sure, these are large sums, but compared to what? How much would it cost were our water distribution and treatment systems to fail?

There are two primary sources of funding for drinking water infrastructure – rate payers and government. While funds raised from water customers cover operation and maintenance, it can be very difficult to raise rates significantly. Most people seem to assume that cheap water should be ours by right and that government, somehow, should find the means to pay for it on its own. To those in the water business, our unwillingness to make the proper level of investment is foolhardy. George Hawkins, former head of the District of Columbia Water and Sewer Authority, makes a telling comparison: "People pay more for their cell phones and cable television than for water. You can go a day without a phone or TV. You can't go a day without water."[9]

When Hawkins approached the District of Columbia's City Council to ask for a modest rate raise, though, he was raked over the coals. Jim Graham, a council member, proclaimed, "This rate hike is outrageous. Subway systems need repairs, and so do roads, but you don't see fares or tolls skyrocketing. Providing inexpensive, reliable water is a fundamental obligation of government. If they can't do that, they need to reform themselves, instead of just charging more."[10] Graham was unhelpfully silent on how the water utility can reform itself to provide the money necessary for maintenance and upgrades on a decaying system.

The second source of funding, which has proven critical for infrastructure, is federal grants and loans. The Drinking Water State Revolving Fund (DWSRF) was added in the 1996 amendments. From 1998 to 2016, the federal government invested about $19 billion in the DWSRF, which has resulted in more than $32.5 billion going to water system projects across the nation. In 2018, Congress passed the America's Water Infrastructure Act (AWIA). This reauthorized the DWSRF, increasing its budgets with $1.174 billion authorized in 2019, $1.3 billion in 2020, and $1.95 in 2021. The loan amortization period was also extended from twenty to thirty years (and from thirty to forty years for disadvantaged communities).

Congress has also passed legislation creating new funding programs. The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) provides low interest, long term federal loans to communities for large water infrastructure projects. The Water Infrastructure Improvements for the Nation Act of 2018 (WIIN) was directed at small and disadvantaged communities, with a focus on lead-related issues. $20 million is provided for lead testing in school and child care programs, $10 million for reduction in lead exposure, and $20 million for infrastructure, managerial and financial training in small and disadvantaged communities. This is particularly significant since many small water systems struggle with operations and maintenance.

Perhaps the greatest immediate funding challenge is posed by lead service lines. There are over 6 million lead service lines in the country, connecting homes to the large water mains running underneath the streets. As explained in the Flint story, lead service lines are not necessarily a problem so long as corrosion inhibitors are kept at correct levels in the water. If the water becomes corrosive, though, or the protective layer is dislodged, then lead can dissolve into tap water. Replacing these lines is further complicated by the fact that the utility only owns the lines up to the property line. Households own the lines from the sidewalk to the home. Washington, DC, launched a large partial lead service line removal project, replacing only the service lines from the water mains to the edge of the property line, but learned that this was worse than doing nothing because it dislodged the protective layer inside the pipe and introduced even more lead into water than before.

[9] Charles Duhigg, *Saving U.S. Water and Sewer Systems Would Be Costly,* NEW YORK TIMES (March 14, 2010).
[10] *Ibid.*

Numbers are inexact, but about 15-22 million citizens get their water through lead service lines. Utilities are not required to remove the entire lead service line and it will be expensive to do so. Congress appropriated over $120 million for lead service line replacement in Flint. EPA estimates that it will cost from $16-$80 billion dollars to replace lead service lines across the nation.

A fundamental challenge facing many cities is the shortcoming of the rate-based funding system. Many small systems do not have the rate-paying base to support upgrades in infrastructure or treatment technologies. In larger cities with a shrinking population base, a vicious cycle of rising costs for decaying infrastructure drives up rates for those who can least afford it. Consolidation of water systems has been posed as one remedy, but rates of consolidation have remained low for both business and local political reasons.

There are no easy answers to these challenges. Taken together, the DWSRF, WIFIA, AWIA and WIIN represent important funding measures, particularly in an era of legislative gridlock. But the levels remain far below the hundreds of billions of dollars that EPA and the water industry deem necessary to maintain infrastructure, much less modernize it.

Indeed, there has been a remarkable lack of innovation in the water sector compared to other utilities such as electricity generation. While modern treatment technologies such as granular-activated carbon, membranes, and ultraviolet light or ozone for disinfection are commercially available, they are the exception rather than the rule. Most PWS rely on mid-twentieth century technologies and older. On their face, the water and electricity sectors share key similarities – natural monopoly, regulatory oversight, and risk aversion. Yet there are also key differences. There are more investor-owned utilities in the electricity sector and greater competition through regional grids.

As a comprehensive study of the two sectors concluded,

> Most public water suppliers are governed either by local government officials (e.g., members of city councils) or by elected boards (e.g., the board members of irrigation districts). In voting for such officials, members of the local public generally seek three goals: reliability, safety, and low water prices. Elections for water officials are seldom contested except where these goals are threatened... A number of these factors— high fragmentation, public ownership, political pressure for low water rates, and reliability concerns—as well as other issues, inhibit innovation.[11]

Looking Forward

Despite the daunting challenges posed by emerging contaminants, lead service lines, source water protection and inadequate funding, provision of safe, reliable drinking water is routinely provided throughout the United States. Our tap water is safer than it has ever been. This is something to be celebrated, and a critical benefit billions of people throughout the world do not enjoy. This success, though, has led to a situation where safe water is largely taken for granted. It only takes a Flint disaster to make clear that this is a misplaced assumption.

Continued protection of our drinking water will require vigilance and perhaps a transformation. We are used to enjoying safe water and paying monthly bills as "consumer drinkers." Fundamental protection of our drinking water will not occur, however, unless we take

[11] Newsha Ajami et al., *The Path to Water Innovation,* THE HAMILTON PROJECT DISCUSSION PAPER 2014-06 (2014).

on the role of "citizen drinkers," using our political process to demand effective protection through better enforcement of SDWA, adequate funding for our water infrastructure, and renewed scrutiny of activities threatening our source waters.

QUESTIONS AND DISCUSSION[12]

1. A public-minded doctor discovers serious contamination of the town's water. His efforts to alert local officials are rebuffed. Concerned over how this will affect their reputation and the town's economy, the authorities sit on the evidence, deny any problems, and denounce the doctor. All the while, trusting people continue using the unsafe water. While the setting may call to mind Flint, this is actually the plot from Henrik Ibsen's classic 1882 play, *An Enemy of the People*. Covering up contaminated drinking water is not a new problem. Why do you think the Michigan Department of Environmental Quality publicly attacked people like Marc Edwards and cherry-picked data? There was no corruption, in the sense of using public office for private gain. No one got rich or promoted because of Flint. The Department clearly was not working in the public interest. What explains the state environmental agency covering up water quality problems?

2. As described in the chapter, Flint municipal regulations in 1897 actually required the use of lead service lines to connect houses with the water mains. Lead pipes were not banned by SDWA until 1986. Nor was this solely an issue in Flint. Lead service lines are found in many regions of the country, with estimates ranging from three to ten million homes affected. In addition to Flint and Washington, D.C., there have been lead in drinking water problems in Columbia, South Carolina, Durham and Greenville, North Carolina, Pittsburgh and Newark, just to mention a few cities.

Why not just address the risk head on and remove lead service lines? That's what Flint mayor, Karen Weaver, pledged to do at a press conference in February, 2016, promising that the city would remove and replace all of the city's 15,000 lead service lines (which, apart from the money, was difficult because there was no easy way to determine which houses had lead service lines). As explained above, property law also makes this a particularly challenging problem. Water utilities own the water mains and service lines, but only until they cross the sidewalk. Once the service line runs underneath a homeowner's lawn then it is on private property. Utilities have been wary of the liability from working on someone's else's property.

After months of negotiation in Congress, the city was given money to carry out lead service line replacement, but it costs millions of dollars. Lansing, Michigan, spent $42 million to replace 13,500 of its lines in 2004. If you cost this out nationwide, the effort will be on the order of $15 billion. Is that too much to spend for a problem that can be avoided by properly treating the water with corrosion inhibitors? And who should pay for it – the federal government, states, cities, or private parties? If private parties, what should be done about the different incentives of landlords and renters?

3. President Nixon's main objection to SDWA was over funding. His administration argued that the billions of dollars necessary to upgrade city's treatment plants should be funded not by

[12] For a Teacher's Manual with answers to these questions, please email salzman@ucsb.edu.

the government but by water users, themselves. Utility could simply add a surcharge onto water bills to pay for all necessary capital costs. Indeed, the Government Accountability Office reports that roughly 85% of water utilities currently cover their costs through user fees. Given this, was Nixon right? How would you argue in favor of a much smaller role for the federal government in funding public water systems?

4. Are people better off drinking bottled water instead of tap? After all, bottled water is now the top selling beverage in America, exceeding soda. Leaving aside all the packaging issues, bottled water may not be so great for you.

SDWA does not regulate bottled water at all. Instead, it is regulated as a food product by the Food and Drug Administration (FDA). As a result, the monitoring and inspection requirements for bottled water are, in practice, a good deal weaker than those for tap water. If contaminants are found in tap water, which is tested daily, the water utility must quickly inform the public. If contaminants are found in bottled water, which is tested weekly, manufacturers must remove or reduce the contamination but there is no similar requirement to notify the public. Perhaps most important, FDA regulations only apply to goods in interstate commerce, i.e., traded across state lines. Yet anywhere from 60 to 70 percent of bottled water never enters into interstate commerce. As a result, two-thirds or more of bottled water passes is effectively exempt from federal regulation.

A study by Co-op America found that forty–three states fund one or fewer officials to supervise bottled water. Contrast the frequency and thoroughness of the inspections these people could possibly conduct with the fact that New York City tests its tap water more than 330,000 times every year. Moreover, the potential fines for violating the bottled water rules are small, just $100 for a first offense and $500 for subsequent offenses in Massachusetts, if fines are ever levied in the first place. Bottled water manufacturers have sought to fill this regulatory gap through private certification. The industry's trade association, the International Bottled Water Association, has created a set of inspection standards that all members must satisfy. These include submission of daily samples for independent laboratory testing and surprise inspections by a third party. The trade association covers 85 percent of the bottled water sold in the United States.

The net result does not favor bottled water over tap water. A four–year study by the environmental group NRDC of more than a thousand bottles of water from more than a hundred different brands concluded that while most of the bottled water was fine, overall quality was "spotty." About one–third of the bottles contained arsenic and other carcinogenic compounds that, in some cases, exceeded state or industry standards. Other studies have found similar results.

Much of bottled water may in fact be cleaner than tap water and perhaps safer to drink, but we have no way of really knowing. Compared to tap water, bottled water is subject to weaker regulations, much less frequent monitoring, largely meaningless labeling, and broad exemptions. And the few large studies that have been conducted suggest there are plenty of examples where bottled water is more contaminated than tap water, sometimes significantly so. Assuming bottled water is safer than tap water may make us feel better, but there is little reason to think this is necessarily so.

5. The failure of the Des Moines Water Works' lawsuit against farming drainage districts made clear just how toothless SDWA is in addressing contamination of drinking water by farming practices. This is a big problem. Pollution from pesticides and fertilizer have led to "blue baby" syndrome (excess nitrates in the water) and serious contamination of drinking supplies in small farming communities.

SDWA assigns primary authority to water utilities for ensuring safe drinking water but they have virtually no authority over sources of water contamination. Neither EPA nor the utilities can regulate nonpoint sources pollution from farms. Thanks to the Halliburton amendment they cannot regulate fracking. And they cannot regulate the storage of dangerous chemicals near water supplies (a leak from a storage tank just above the water plant's river intake led to mass contamination of the Charleston, West Virginia, water supply in 2017).

As a result, water utilities are placed in the position of cleaning up water that has already been contaminated. It would be much more efficient to avoid the contamination in the first place. This dynamic occurs throughout environmental law, and pits pollution control (cleaning after the fact) against pollution prevention (avoiding harm in the first place).

SDWA provides authority for EPA to sue parties that pose "an imminent and substantial endangerment to drinking water." EPA has used this authority against dairy farms in Yakima Valley, Washington, for example, to craft a consent decree changing their practice of manure management that was polluting local drinking water. This power is rarely used, though – only a few times a year. Why do you think EPA is so reluctant to use this authority? If you were amending SDWA, what changes would you make to strengthen pollution prevention? *See* Margot Pollans, *Drinking Water Protection and Agricultural Exceptionalism,* 77 OHIO STATE LAW JOURNAL 1195 (2016).

6. Should there be a human right to water? The United Nations General Assembly thinks so. In 2012 they adopted a resolution recognizing the "the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights." The resolution called upon:

> States and international organizations to provide financial resources, capacity-building and technology transfer, through international assistance and cooperation, in particular to developing countries, in order to scale up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all.

The state of California passed AB 685 in 2012, stating that:

> (a) It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.
> (b) All relevant state agencies, including the department, the state board, and the State Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.
> (c) This section does not expand any obligation of the state to provide water or to require the expenditure of additional resources to develop water infrastructure beyond the obligations that may exist pursuant to subdivision (b).

(d) This section shall not apply to water supplies for new development.

(e) The implementation of this section shall not infringe on the rights or responsibilities of any public water system.

Does California's law satisfy the UN resolution? How does it ensure that drinking water is safe, clean, affordable, and accessible? Can a citizen sue if her family does not have easy access to safe drinking water or if she cannot afford to pay her water bill? Whom would she sue?

7. The cover of the August 2011 *Reader's Digest* cover featured a photo of a glass of water and the headline, "How Safe Is Our Water?" In smaller type, the cover read, "may contain: rocket fuel, birth control pills, arsenic, and more shocking ingredients." How would you explina to the person next to you in the check-out lane why this cover is both accurate and misleading?