Teacher's Manual for *THE PAST, PRESENT AND FUTURE OF THE SAFE DRINKING WATER ACT*

James Salzman

Thanks for considering teaching this primer on SDWA. I enjoy teaching this in the classroom and there are a lot of different entry points for productive discussion. Rather than provide canned lecture notes, below I describe the key points I raise when teaching the materials and opportunities for class discussion. The specific topics are set out in bold below for easier identification. Please contact me at salzman@ucsb.edu if you have any questions about the materials.

When teaching SDWA, I briefly highlight **drinking water issues in the news** (such as Newark or PFOA and PFAS contamination in the Fall of 2019), but I then turn to history. I ask the students to place themselves 500 years ago or 1500 years ago and ask what they would do were they charged with providing safe drinking water to their community. It turns out the challenges are identical to today.

You need to ensure a source, protect it or treat the water, and move it to the point of use without contaminating it. Each of these steps raises different policy challenges. The key point I try to get across is that **providing safe drinking water is as old as civilization**. Indeed, virtually every archeological excavation of a major settlement has revealed sophisticated (for its time) water technologies. This has to be the case. Otherwise the community could not endure. Above the Dead Sea, one of driest places on earth, the builders of Masada created a massive cistern. Beneath Constantinople lies a huge water reservoir complete with ornate arches. A related point is that all of this infrastructure required significant funding. Finance is as much a part of drinking water infrastructure as technology.

Three points about the **history of SDWA** are particularly interesting. The first is how the federal government bootstrapped chlorination into local communities. Prior to SDWA, the feds did not have authority to regulate local drinking water treatment. The Public Health Service cleverly got around this by regulating interstate common carriers. If a train or bus passed through your town and took on water, it had to be chlorinated. A second point worth highlighting is the distinction between "pure" and "safe." This is a great opportunity to explore why we really do not want totally safe drinking water. We could provide distilled water but the cost would be enormous. We always trade off between greater protection and cost (even in statutes when you're not supposed to do this). SDWA provides an easy example to discuss why this has to be the case. The last point concerns what SDWA did not address. The law could have looked very different. Nixon's opposition primarily lay in his concerns over cost. What would the law look

like it if had placed financing burdens on rate payers? What if it had been given authority to regulate source water protection?

In discussing the practice of SDWA, it's important to emphasize the **sheer number of public water systems** – over 150,000. The vast majority of these are small, and these also pose the greatest compliance and enforcement challenges. When an MCL is set, the compliance costs for small systems can run in the millions. For systems with a small base of rate payers, or lower-income rate payers, this is a real challenge. SDWA explicitly requires a cost-benefit analysis, but it does not provide for different CBA's based on the financial capacity of the system. Does it make sense to have different standards for smaller communities? Perhaps so from a financial perspective, but that raises real environmental justice concerns. Can this be considered an unfunded mandate?

The contaminant coverage section provides a nice opportunity to discuss the **pros and cons of statutory timetables**. The SDWA of 1974 was painfully slow in promulgating MCLs, but the mandated schedule created its own set of problems. The analyses were rushed and small water systems complained that the level of burdens imposed on them were not being adequately considered. The right balance is hard to strike. The schedule was eliminated in the 1996 amendments and, it must be admitted, the pace of promulgating new MCLs has ground to a virtual halt.

The **emergent contaminants** challenge provides for great classroom discussion. No one likes to think they are drinking rocket fuel or birth control pills when they drink from the tap (or from most bottled waters). But that's the case. The question is what to do about it. I will address this issue in more detail when discussing Question 7 at the end of the chapter.

The **high level of noncompliance** under SDWA is striking. This is a good opportunity to point out the challenges of enforcing against public (and quasi-public) entities. There is a similar situation with POTW's under the Clean Water Act. These are largely funded by rate-payers and effectively suing yourself is hard to do. Part of this problem, too, is the low level of citizen suits. I still don't have a good explanation for why there are so many fewer SDWA citizen suits than CWA suits but the difference is striking. The public/private nature of the defendants is likely important, but that doesn't entirely explain the difference. In any case, it's important to highlight, since citizen enforcement plays such a key role in pollution statutes.

I discuss the **challenge of source protection** in Question 5, but this creates a great opportunity to discuss watershed management and, in particular, payments for ecosystem services. This is particularly relevant if you want to teach this in a natural resources law course. I have written a primer on ecosystem service payments that you may find helpful as background or as an assignment. The most interesting questions here are the role of payments as a policy

instrument and the relative potential/pitfalls of private versus public governance for land management. You can also refer to the Catskills story at pages 13-14 as a successful example.

You can't teach SDWA without discussing **Flint**. I can't emphasize enough how much this changed the public's conception and interest in drinking water. I published my book, *Drinking Water: A History*, in 2012. I called it my "airport bookstore" project because it was intended for a popular audience. When Flint broke, my published reached out and said we needed a second edition. There was effectively a new and large audience concerned about these issues. It's commonplace now to see front page newspaper articles on lead in drinking water. That was not the case prior to 2015. The case study is self-explanatory, but the level of governance failure is staggering. No government official comes out of this looking good. It's an easy place to talk about environmental justice and limits on oversight as a safeguard, discussed in Question 1. I discuss the financial challenges of lead service lines in Question 2.

The George Hawkins quotes are a fun way to explore the problem of **infrastructure financing**. Most people are familiar with the problems of underfunded bridges and roads, but they give little if any thought to the pipes under the streets. It's easy for politicians like Jim Graham to posture about how utilities should "reform themselves," but they get unhelpfully silent when it comes to rate increases that are, of course, often politically unpopular. This is a challenge in both wealthy and poor communities.

Question 1

I always love the chance to slip in a little high culture. It's striking how the themes Ibsen discussed still resonate today. It's difficult to explain how Flint happened. To be sure, the Emergency Manager focused on cost-cutting, but he certainly did not want to poison people. The MDEQ viciously attacked people such as Marc Edwards and Mona Hanna-Attisha (the pediatrician who really blew the issue wide open with her study on blood levels in children before and after providing water from the Flint River) as ignorant or outside troublemakers. As pointed out in the Question, this was not a classic case of government corruption, where people are lining their pockets. This was not about money or power.

My best sense is that both MDEQ and EPA lost sight of their agency mission to protect the public. They focused, instead, on protecting the agency. The regional EPA office reprimanded Del Toral and held back from intervening because it did not want to seem heavy-handed. MDEQ sought to protect its reputation and kept doubling-down that there was not a problem. If nothing else, Flint shows very clearly the importance of citizen science. Without the interventions of Edwards and Hanna-Attisha, this problem certainly would have remained unknown for much longer.

Question 2

This is fast-moving topic, so you will want to update yourself with a Google search before discussing this question. Congress ended up funding Flint's replacement of lead service lines but is still debating what to do about the national challenge. Is $15 billion a lot or a little to remove the threat of lead from service lines? A cost benefit analysis would likely suggest that's a great deal, but where will the money come from? Students should be challenged over whom should pay. This is, after all, fundamentally a local issue. That said, the lines have not been replaced so perhaps federal funding is necessary. If cities have to pay, what does that mean for other poor cities like Flint?

A further point about the wisdom of replacing lead service lines is that, at least in theory, the problem can be managed fine by ensuring the consistent use of corrosion inhibitors such as orthophosphates. Removing lead service lines provides certainty against management failures in treating the water. But is reducing that risk worth the cost?

The landlord/tenant dynamic is important and one usually missed by students. Tenants are obviously the ones most impacted by lead in drinking water. Yet they don't own the house or service lines. From a purely financial perspective, the landlords have little incentive to replace the service lines. They are not liable since most houses have lead lines. This is a classic case of split incentives and, unless landlords are required to remove the lines, there is no obvious policy intervention to address this problem.

Question 3

One could easily imagine a model where there was very little public funding of drinking water infrastructure. In the energy field, for example, there is far less federal funding of infrastructure. Most of the electricity grid is funded by utilities. Why shouldn't this also be the case for drinking water? As pointed out in the note, most costs are currently funded by water utilities. The problem, of course, is that many small water systems and poor cities don't have the rate base to cover improved infrastructure costs. But why should this fall on the federal government instead of, for example, states?

Question 4

Students love learning more about bottled water. I was first inspired to write about drinking water back in 2004 when I was teaching a class on the CWA. As I commented on how amazing it was that we now have greater access to safe drinking water than ever before, I looked around the classroom and about half the students had bottles of water sitting on their desks. What do they think they're buying, I thought? The popularity of bottled water has shrunk in the classroom, where Nalgenes are much more prevalent; but the market keeps growing. Bottled water surpassed sodas as the number one commercial beverage in 2016.

The huge gap in regulatory oversight between tap water and bottled water is particularly striking. A good discussion topic is whether private governance can make up the difference. It would be devastating for Dasani or Aquafina to have a large problem with water contamination, so they have strong incentives to ensure rigorous testing. The same may not be true, though, for more local bottling companies.

Question 5

JB Ruhl has explained well the large exemptions enjoyed by agriculture from environmental law. This is certainly true for source protection. Neither SDWA nor the CWA provide effective authority to prevent contamination of drinking water sources from pesticides and fertilizer. States can do so, but the federal statutes are largely toothless.

EPA's endangerment provision does provide the authority to take direct action. Why is it used so sparingly? Margot Pollans' article provides a thorough explanation of this issue.

> SDWA limits the authority to bring endangerment suits to the EPA itself. Neither states, nor water utilities, nor water users may bring these suits. The original purpose of the provision was to provide a federal backstop where state and local authorities were not taking adequate action to protect the public health.
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> Endangerment suits also suffer from several other limitations. First is the EPA's limited resources. Indeed, the EPA brings only a handful of these suits per year. Second is the standard for making a claim. Although court's reviewing administrative orders apply an arbitrary and capricious standard, they impose a heavy burden on the agency to establish that there is a threat to health and that the ordered action will remedy that threat. Finally, while the EPA occasionally orders cleanup, its enforcement orders more often require monitoring, and, in the case of contamination, provision of alternate sources of water, such as bottled water.
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> Nevertheless, one recent prominent example demonstrates that if employed strategically, this tool could be honed to curb agricultural nonpoint source pollution. In 2013, the EPA entered into a consent decree with five dairies in Yakima Valley, Washington. The EPA found that manure management practices at the dairies, including lagoon storage and field spraying, were contaminating local drinking water supplies and ordered the five dairies to provide alternative water sources to neighbors with private wells, establish monitoring programs, and adopt a number of specific manure management best practices.
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> Despite the potential of endangerment suits as a powerful regulatory tool in extreme instances, it is unlikely to lead to widespread change because of limitations on EPA's

resources. The EPA simply cannot undertake a systematic campaign of suing farmers on drinking watersheds.

Question 6

This is a great topic for class discussion. You should push the students to be specific about what a human right to water can mean in practice. Does it require a cap on prices for poor families? Does it mean that communities without access to safe drinking water should be able to sue the state for provision of water? The California statute has been largely symbolic. It does not create a separate cause of action.

The tension in the UN resolution is also worth highlighting. The resolution states that water must be affordable. What does that mean in practice? Government subsidies? Price caps? What about when the supplier is a private rather than public utility?

To provide further context for this topic, below is useful background on the terms set out in the UN resolution from a UN website.

- **Sufficient**. The water supply for each person must be sufficient and continuous for personal and domestic uses. These uses ordinarily include drinking, personal sanitation, washing of clothes, food preparation, personal and household hygiene. According to the World Health Organization (WHO), between **50 and 100 litres** of water per person per day are needed to ensure that most basic needs are met and few health concerns arise.
- **Safe**. The water required for each personal or domestic use must be safe, therefore free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health. Measures of drinking-water safety are usually defined by national and/or local standards for drinking-water quality. The **World Health Organization (WHO) Guidelines for drinking-water quality** provide a basis for the development of national standards that, if properly implemented, will ensure the safety of drinking-water.
- **Acceptable**. Water should be of an acceptable colour, odour and taste for each personal or domestic use. [...] All water facilities and services must be **culturally** appropriate and sensitive to **gender, lifecycle** and **privacy** requirements.
- **Physically accessible**. Everyone has the right to a water and sanitation service that is physically accessible within, or in the immediate vicinity of the household, educational institution, workplace or health institution. According to WHO, the water source has to be within **1,000 metres** of the home and collection time should not exceed **30 minutes**.
- **Affordable**. Water, and water facilities and services, must be affordable for all. The United Nations Development Programme (UNDP) suggests that water costs should not exceed **3 per cent** of household income.

If you wish to discuss the issue of drinking water outside the United States, the UN website provides further useful information.

- In rural Sub-Saharan Africa millions of people share their domestic water sources with animals or rely on unprotected wells that are breeding grounds for pathogens.
- The average distance that women in Africa and Asia walk to collect water is **6 kilometres**.
- Average water use ranges from **200-300 litres** a person a day in most countries in Europe to less than **10 litres** in countries such as Mozambique. People lacking access to improved water in developing countries consume far less, partly because they have to carry it over long distances and water is heavy. For the 884 million people or so people in the world who live more than 1 kilometre from a water source, water use is often less than **5 litres** a day of unsafe water.
- The basic requirement for a lactating women engaged in even moderate physical activity is **7.5 litres** a day.
- At any one time, close to half of all people in developing countries are suffering from health problems caused by poor water and sanitation. Together, unclean water and poor sanitation are the world's **second biggest killer** of children. It has been calculated that 443 million school days are lost each year to water-related illness.
- In Tajikistan nearly **a third** of the population takes water from canals and irrigation ditches, with risks of exposure to polluted agricultural run-off.
- A survey of 5 000 schools in Senegal showed that over half had no water supply and almost half had no sanitation facilities. Of those schools with sanitation, only half had separate facilities for boys and girls. The result was that girls chose not to utilise these facilities, either because they did not want to risk being seen to use the toilet, or because they were warned that these facilities were not private or clean enough. Girls also avoided drinking water at school to avoid urination, thereby becoming dehydrated and unable to concentrate
- People living in the slums of Jakarta, Manila and Nairobi pay **5 to 10 times** more for water than those living in high-income areas in those same cities and more than consumers in London or New York. In Manila, the cost of connecting to the utility represents **about three months' income** for the poorest 20% of households, rising to six months' in urban Kenya.

Question 7

The same cover also contains stories about “13 Secrets Your Marriage Counselor Won’t Tell You” and “Most Ridiculous Lies Ever Told.” The drinking water headline is accurate, in the sense that chemical assays of drinking water detect all kinds of medications and industrial chemicals. It is misleading in the sense that their concentrations are very low, on the order of parts per billion or parts per trillion. Does this mean the water is risk-free? Researchers can’t say. They don’t have sufficient lab tests to prove impacts one way or another at such low doses. They think it’s safe, and likely with good reason, but they don’t really know. That said, no one likes the idea of drinking rocket fuel, trace amounts or not.

There are two key points for discussion. The first is how much certainty we need to regulate. Many drinking water contaminants exist at the outer edges of toxicology. When

scientists cannot give us a specific answer, how should regulators respond? The second point is that cost matters. Promulgating a new MCL creates costs for water suppliers, often in the millions of dollars. This is especially challenging for small systems and poor cities. There are no easy answers here, but this dilemma lies at the very heart of SDWA.