



Securing Safe Drinking Water For All

A Guide for Funders Seeking
Equitable & Sustainable Solutions

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WATER
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We have third-world conditions as it relates to drinking water.

—Susana De Anda, co-founder of Community Water Center based in California’s San Joaquin Valley¹

The Flint water crisis brought into bold relief for the nation and the public the intimate relationship between water, race, poverty, and health.

—Radhika Fox, CEO of the US Water Alliance²

Introduction

The health of our communities and ecosystems depends on the availability of clean and reliable water. Yet today, millions of people in the United States do not have safe drinking water in their homes. In addition to outdated and crumbling infrastructure, climate change further threatens drinking water supplies with harsher droughts, more violent flooding, and warmer temperatures that decrease snowpack and increase evaporation. According to the United Nations, water is the primary medium through which we feel the effects of climate change.³ And yet, the drinking water crisis has remained largely invisible.

In 2014, the residents of Flint, Michigan, helped alert the American public to the tragic gaps in how the country provides and protects drinking water. Since then, other incidents have precipitated public outrage and galvanized some politicians to act: toxic algae blooms in Lake Erie; chemical leaks in Charleston, West Virginia; boil-water notices during floods in Austin, Texas; and per- and poly-fluorinated alkyl substances (PFAS) contamination in communities throughout the nation.

During the height of the water crisis, emergency packages were delivered to Flint residents. Source: US Department of Agriculture



Unsafe Drinking Water Threatens Public Health

- Bacteria and microbial contaminants in water cause acute sickness, especially in children.
- Carcinogenic and radioactive compounds in water cause chronic disease like cancer.
- When tap water is unaffordable, sugar-sweetened beverages are common replacements, contributing to increased obesity and illnesses like diabetes.
- An Ohio Valley class action suit linked PFAS to kidney and testicular cancer, ulcerative colitis, high blood pressure, pregnancy-induced hypertension, and thyroid disease. The suit resulted in a manufacturer payout of over \$1 billion.

In each crisis, residents did not have potable water to cook, bathe, brush their teeth, or drink for several days or longer. Many continue to lack access to potable water.

While these events have sparked headlines, threats to drinking water are more widespread than isolated incidents. In just the last three years, more than 1,400 water systems serving 3.7 million people exceeded the federal legal limit for lead, one of over 250 water contaminants⁴ found in the homes of as many as 45 million Americans each year.⁵

A Carnegie-Knight News analysis of US Environmental Protection Agency (EPA) records found that 63 million residents—a fifth of the country's total population—have been exposed to unsafe drinking water in the last decade.⁶ It is no wonder that public polling consistently shows that polluted drinking water is among Americans' greatest worries and highest priorities, cutting across ideology and political affiliations.⁷

In a nation with the strongest economy in the world, millions of US residents face at least one of three key challenges:

- **Unsafe water**
- **Unaffordable water**
- **Unreliable water**

Where a person lives, how much money they have, and their proximity to a polluter can determine whether they have safe water. Children, pregnant women, the elderly, and individuals with suppressed immune systems are among those hurt the most by contaminated drinking water sources.⁸ Left unaddressed, the drinking water crisis at best threatens people's health and their basic ability to live a good life. At worst, it can have fatal consequences.

Philanthropy's Role

The challenges of ensuring safe drinking water are ripe for action, fact-based interventions, and collaboration among entities who traditionally may have been disconnected or even at odds. Philanthropic investment can ensure solutions are implemented at the scale of the problem.

While total annual foundation philanthropy for environmental issues in the US approaches more than \$5 billion, only a fraction—approximately \$160 million—supports work in freshwater. Recently, a growing number of funders have recognized the often-hidden public health crisis of unsafe drinking water in the US, but many have voiced uncertainty on appropriate entry points for their own grantmaking.

In 2016, a survey of foundations conducted by the Health and Environmental Funders Network found philanthropy is approaching drinking water issues from several different perspectives—from concern for children's health to watershed protection to environmental justice. Yet, despite the variety of approaches, survey respondents prioritized support for advocacy, community organizing, and government oversight and accountability.

This guide builds on those priorities to help funders understand current and emerging threats to drinking water and to support solutions that tackle both immediate problems and root causes. The guide draws from the River Network's Drinking Water Guide⁹ as well as the State Policymakers' Toolkit by the US Water Alliance and The Council of State Governments.¹⁰ The Water Foundation's team of policy experts, water scientists, and campaign strategists offer this resource to other grantmakers as an invitation for expanded funder collaboration on drinking water.

Threats to Drinking Water 101

In the US, millions of people live in places where toxic tap water is causing infections, cancer, and other serious diseases. Families are struggling to pay monthly water bills, and the threat of water shut-offs looms over many households. Others do not know if water will flow from their faucets because their homes lack indoor plumbing or because of water shortages, which are increasingly common due to worsening droughts. To make sure everyone has safe drinking water, we must understand the root causes of this crisis.

Unsafe Water

Safety threats to drinking water are complex; not only are there various sources of water pollution, but contaminants reach people through several different pathways.

Contaminant Sources

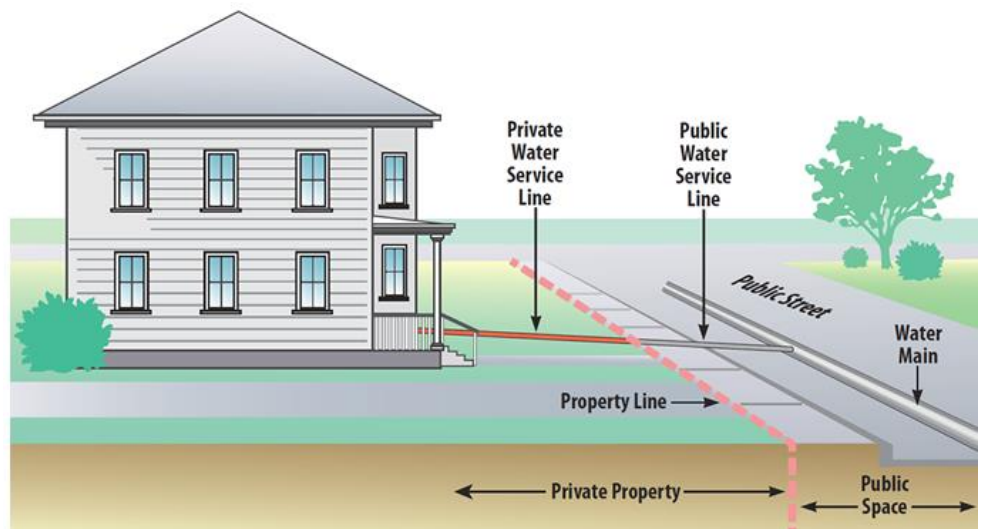
Drinking water contaminants come from a broad range of sources, including:

- **Agricultural inputs.** Fertilizers, pesticides, herbicides, fumigants, and other chemicals used on lawns and agricultural landscapes can leach into drinking water sources. Nitrogen and phosphorus from fertilizer and animal waste have created a widespread challenge across the country.
- **Industrial byproducts.** Waste water from oil and gas development, chemicals from mining, and pollutants from manufacturing contaminate source water. Decades after industrial processes cease, these contaminants can still persist in water sources.
- **Nature-based causes.** Geological formations can leach carcinogenic compounds, such as arsenic and uranium, into water supplies.

Contaminant Pathways

Contaminated water from the sources listed above gets delivered to people in several different ways. Understanding where contaminants enter drinking water systems can help identify where intervention is most needed to ensure safe water. Pathways that most often carry contaminated water to people include:

- **Source waters:** Pollution of the rivers, lakes, reservoirs and underground aquifers used as drinking water supplies.
- **Treatment and distribution systems:** Water treatment plants and distribution infrastructure can introduce treatment byproducts and can leach contaminants into water as it is delivered to customers.
- **Premises plumbing:** Old pipes, including private water service lines, and plumbing fixtures can carry lead and copper to taps, making drinking water supplies toxic. Premises plumbing creates some unique challenges since pipes and plumbing on private property is the responsibility of the home or business owner.



Source: Boston, MA Water and Sewer Commission Lead Replacement Incentive Program

Regulatory Framework

Water quality is regulated through two main federal statutes: the Clean Water Act and the Safe Drinking Water Act. Enforcement of these statutes is largely delegated to the states.



Runoff pipe in disrepair. Source: Tracy Lee Carroll

CLEAN WATER ACT (CWA)

Originally passed in 1972, the CWA authorizes the EPA to regulate the discharge of pollutants into surface water bodies. The law is intended to keep contaminants out of US waterways, including drinking water sources, and provide “source water protection.” It is premised on the concept that all discharges are unlawful, unless specifically authorized by a permit. These permits help reduce the amount of contamination entering surface water supplies.

The CWA is implemented through federal-state partnerships. The federal government, through the EPA, establishes guidelines, objectives, and limits. Through the Clean Water State Revolving Fund, federal grants are made to states to distribute to local governments—mostly in the form of low-interest loans—to build systems to treat wastewater and stormwater. States carry out the law with their own monitoring, assistance, and enforcement programs. Congress has occasionally revised the act to address new challenges like toxic pollutants and stormwater runoff. Groundwater remains completely unregulated by the act.

SAFE DRINKING WATER ACT (SDWA)

The SDWA, first passed in 1974, enables the EPA to set national health standards for drinking water and enforce these standards. The law applies to drinking water supplies from both surface water bodies and groundwater.

The SDWA regulates approximately 100 specific contaminants.¹¹ For each regulated contaminant, the EPA has set a legal limit on the concentration of that contaminant that can be present in drinking water. The limit, or maximum contaminant level (MCL), is based on an assessment of the health impacts of each contaminant, balanced with the technical feasibility of detecting and treating the contaminant and the cost of treatment to the water system.

Public water systems must test for regulated contaminants. If an MCL is exceeded, water systems are required to notify the public and treat or replace the water supply.

The EPA distributes funding through the Safe Drinking Water State Revolving Fund to support system improvements that comply with federal standards. In addition to the federal law, state, tribes, and territories have the authority to establish MCLs for federally unregulated contaminants. They can also establish more stringent MCLs than existing federal law.

Current Regulation and Enforcement Is Not Sufficient

Over 5,000 water systems are currently out of compliance with federal drinking water standards, according to a recent University of California, Irvine study.¹² Still, the SDWA only regulates large water systems and does not apply to water systems serving fewer than 25 people or areas reliant on groundwater wells.

When scientists and water regulators discover new contaminants in water supplies, such as PFAS and 1,2,3 TCP, water regulators can be slow to respond. It took California 14 years to regulate Chromium-6,¹ the contaminant brought to national attention by the film *Erin Brockovich*. The federal government has yet to act on the chemical, and the EPA has not regulated a new water contaminant in more than 20 years.

¹ The regulation was challenged in court over its economic feasibility analysis and remanded. It is now subject to a multi-year process to be reestablished.

Unaffordable Water

In 2016, tap water was shut off for approximately 15 million US residents because they could not pay their water bills.¹³ Shutting off water service is one mechanism to enforce payment. In some states, people are threatened with foreclosure when unpaid water bills are turned into property liens.¹⁴

Few policies exist to protect people—including children, people with disabilities, women who are pregnant, and the elderly—from abrupt water shut-offs. Water rates across the country are projected to rise by up to 40% over the next five years. Under that scenario, the proportion of US households with unaffordable water bills could triple from 12% to 36%, or 40.9 million households.¹⁵

Over the next five years, 36% of US households may face unaffordable water bills.

The Price of Water as a Share of Household Income

Water affordability is measured as the amount of a household's income spent on water, or the percentage of median household income (MHI) spent annually on water services. The EPA sets the affordability threshold at 2% of MHI for water service alone and 4.5% for both water and wastewater service. Under this threshold, water becomes unaffordable when it costs more than 4.5% of a household's income.² The situation is exacerbated when tap water is toxic, and households are required to purchase bottled water to drink, bathe, and cook. According to a 2017 Michigan State University study, some of the most severe "pockets of water poverty" are concentrated in low-income areas of Los Angeles, Portland, Detroit, Phoenix, and Philadelphia.¹⁶

Total Price of Water Services

Utilities charge water delivery and treatment costs to their customers. The number of customers served by the water system determines the price per household. Populated communities typically pay less per household as the cost is shared by more customers. In addition to payment for drinking water, households may also pay for wastewater treatment and may incur the cost of replacement water when the drinking water is not potable or is shut off, as well as penalties and fees

² Affordability rates vary. For instance, the California Department of Public Health sets the affordability threshold at 1.5% of MHI.

While federal funding for infrastructure has decreased, US water systems will require over \$1 trillion in investment over the next 25 years.

associated with water shut-offs and reconnections. Today, two key factors are driving up the price of water for US families:

- Water infrastructure is nearing the end of its useful life. The latest studies estimate the US will need to spend over \$1 trillion in the next 25 years to replace aging infrastructure and modernize water systems.¹⁷
- Climate change is driving more intense storms that bring greater risks of flooding and sewer overflow as well as more intense drought that creates water scarcity. Studies estimate that climate change adaptations will cost water systems more than \$36 billion by 2050.¹⁸ At the same time, toxic pollutants from human activities shrink safe water supplies and raise water treatment costs.

Federal funding for local water infrastructure has decreased significantly in recent decades. State funding for infrastructure upgrades is also limited, placing a greater burden on customers to bear the cost of these required upgrades.

Communities served by small systems—which are often rural—are facing some of the steepest price increases. If water is contaminated, expensive treatment costs must be borne by a relatively small set of customers. This can cause water bills for individual families to skyrocket. Some US cities are also losing population, shrinking the customer base over which to spread the costs and placing a growing financial burden on the remaining households. In Detroit, for example, thousands of households were unable to pay their water bills and faced service shut-offs in 2014.¹⁹

Water Rate-Setting

There are over 50,000 water systems in the US, and approximately 80% are publicly owned. In general, publicly-owned water systems are overseen by elected boards. These boards have the responsibility to set water rates, and ostensibly, can be held accountable by the electoral process. Privately-owned water systems are regulated by Public Utilities Commissions (PUCs) or Public Service Commissions (PSCs).²⁰ In most cases, PUCs or PSCs require a formal public process to set water rates, often called a “rate case.”

While there are rarely enforceable provisions that require water systems to provide affordable water, customer assistance programs exist in both publicly- and privately-owned water systems. This assistance can include bill discounts, flexible payment terms, temporary assistance, or water efficiency upgrades.

Inequitable Water Governance

Many drinking water threats reflect deeper social inequity, racist land and water use policies, and governance problems. Decisions that shape drinking water outcomes are too often made with little input from the full range of water users, especially low-income communities and communities of color.

Recent research examining local water boards in California’s Central Valley concluded that while the area is predominantly Latinx, fewer than 15% of local water board members were Latino, and none were Latina.²¹ Almost 90% of water board seats in the region went uncontested over the last four years, giving incumbents an enormous advantage and allowing many boards to forego the election process entirely. Boards that do not include fair and equitable representation may fail to respond to the needs of their constituencies while favoring more privileged water users such as industry or large landowners.

Unreliable Water Supply

In the 1970s, when the CWA and SDWA were first passed, the federal government contributed more than 60% of total capital spending on water infrastructure. Today, the federal contribution has dropped to around 9% and, in most cases, local spending has not replaced the lost funding. Consequently, in many places, aging or inadequate infrastructure is threatening water supply reliability.

In addition, when water demand outstrips supply, water reliability is threatened. Thus, climate change, drought, and other supply stressors are also contributing to more unreliable water.

Aging and Inadequate Infrastructure

Nearly two million US residents do not have a toilet, tub, shower, or running water, according to the Census.²² Tribal lands are among the places most in need of water infrastructure. More than 40% of Navajo Nation residents lack running water, and instead get their water from monthly deliveries.²³

Drinking water for most US residents is delivered via one million miles of pipes across the country. Many of those pipes were laid in the early- and mid-20th century with a lifespan of 75 to 100 years, which means they are at or near the end of their expected life.²⁴ As a result, a water main breaks nearly every two minutes in US.

Water Stress

Watersheds are considered stressed when water demand from agriculture, power plants, industry, and municipalities exceeds 40% of available supply. The most recent National Climate Assessment identified widespread water stress across much of the Southwest, the western Great Plains, and parts of the Northwest. Water stress is only expected to increase due to more extreme weather associated with global climate change.²⁵

How Philanthropy Can Support Safe Drinking Water Solutions

Philanthropy has an opportunity to confront the structural barriers to safe, affordable, and reliable drinking water. Funders, particularly those with overlapping networks in environmental and health fields, can support solutions that solve urgent and systemic problems together.

Already, philanthropy has identified several broad solution sets, including advocacy, community organizing, and increased governmental oversight and accountability. Here, we have identified a subset of promising intervention points to advance these solutions.

Diversify Water Leadership

Philanthropy can help improve drinking water outcomes by broadening the voices and interests at water decision-making tables. Diversifying water leadership can help change historic power imbalances that have contributed to inequitable access to safe drinking water.

Philanthropic interventions could include:

- **Civic engagement** as a key first step to build power in communities without access to safe, affordable, and reliable water. This can include voter registration and get-out-the-vote efforts along with initiatives specifically targeted at increasing water literacy and accountability for elected water leaders.
- **Leadership training programs** to help public institutions that make water decisions better understand the needs of and reflect the communities they serve.

Strengthen Small Water Systems

Philanthropy can support solutions that invest in and grow effective local stewardship of water resources.

Philanthropic interventions could include:

- **Training and capacity-building programs** to help small water systems address common operational and management challenges.
- **Supporting legislation and advocacy to consolidate failing agencies** with successful water systems that are able to deliver safe water to households at an affordable price.

Increase Investment in Water Treatment and Infrastructure

In some cases, neither of the interventions mentioned above will be enough to deliver safe and affordable water, particularly in areas where consolidation is impractical or would lead to unaffordable water. In these instances, philanthropy can support strategies that provide funding for ongoing pollution treatment.

Philanthropic interventions could include:

- **Litigation that aims to recover costs from polluters to treat contaminated water.** This is feasible where man-made contaminants can be traced back to an individual polluter or manufacturer.
- **Public assistance for pollution treatment,** particularly for communities where maintaining safety makes water unaffordable and where there is no polluter with clear liability or where there are naturally-occurring contaminants.
- **Advocacy to increase federal and state investment in drinking water infrastructure,** such as through clean water and safe drinking water state revolving funds or federal infrastructure spending bills.

Support Comprehensive Water Safety Testing

Philanthropy can help increase transparency and strengthen water quality standards by funding increased monitoring.

Philanthropic interventions could include:



Shenandoah water quality testing with local teachers. Source: National Parks Service

- **Projects that increase voluntary testing** through citizen science efforts to collect more comprehensive data, particularly at the tap, and through elected bodies, such as school boards. According to the Government Accountability Office, only 43% of school districts are currently testing water for lead.²⁶
- **Advocacy for mandatory testing** through legislation requiring additional testing or litigation to enforce existing testing requirements. States such as New Jersey and Oregon have passed laws that require testing of domestic wells as part of a property sale, giving prospective buyers important information about their water quality. Legislation could also require testing for emerging contaminants such as PFAS, regardless of the lack of a federal MCL.

Make Water Affordable for Everyone

Clean water is a right but, in practice, it is priced out of reach for many. Philanthropy can help make water for affordable for everyone, no exceptions.

Philanthropic interventions could include:

- **Advocacy to end water shut-offs.** Several utilities have put a moratorium on shut-offs for rental properties where the renters are paying their bills but the landlord is not.
- **Projects that create equitable water rate structures,** such as utility programs that charge lower rates to low-income households, often called lifeline rates, or establish income-based water bill payment agreements.
- **Advocacy for federal assistance programs** that provide families with clean water similar to the Supplemental Nutrition Assistance Program.

Champion Climate Action

Place-based and health-focused philanthropy can help local communities prevent damage to their drinking water supplies from a changing climate.

Philanthropic interventions could include:

- **Projects that build modern and green infrastructure** that is more adaptable to unpredictable water supply and weather extremes.
- **Projects that diversify water supplies** by making better use of formerly wasted water, including rainwater collection, stormwater capture, greywater reuse, and water recycling.
- **Advocacy for source-water protection, pollution prevention, and remediation of contaminated drinking water supplies.** As climate change leads to increased water demand and decreased water supply, we must protect existing drinking water sources and clean up polluted surface waters and groundwater that could supply drinking water.

The drinking water challenges we face in the US are complex and daunting, but they can be solved to protect communities and ensure everyone has safe and affordable drinking water. Philanthropy must drive and scale solutions in this space, and public health and environmental justice provide a moral imperative to address this crisis.



Curb cuts in Elmhurst, Queens.
Source: Chris Hamby

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