DIRECT FROM CDC ENVIRONMENTAL HEALTH SERVICES

Brian Hubbard, MPH

Raquel Sabogal, MPH

Max Zarate-Bermudez, MSc, MPH, PhD

Community Resources for Contaminants of Concern in Private Wells

Editor's Note: The National Environmental Health Association strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC's Water, Food, and Environmental Health Services Branch, as well as guest authors, will share tools, resources, and guidance for environmental health practitioners. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

Brian Hubbard is a health scientist and the Safe Water Section lead. Raquel Sabogal is an epidemiologist and environmental health scientist and is a subject matter expert in water quality. Max Zarate-Bermudez is an environmental epidemiologist and a subject matter expert in water quality. All work at the National Center for Environmental Health in the Water, Food, and Environmental Health Services Branch within CDC.

Public Health Programs Can Help Private Well Owners Understand Water Quality Results

In the U.S., approximately one in five water samples collected from private wells were found to be contaminated with at least one chemical at levels high enough to harm health (DeSimone et al., 2009). Given that about one in eight U.S. residents obtain their water from a private well, access to safe drinking water is vital (Centers for Disease Control and Prevention, 2022). Many private wells are not routinely tested for contaminants, which can be microbiological, chemical, or radiological. Environmental health practitioners serve as a valuable resource, helping their communities to increase well testing, identify contaminants of concern, and understand well water testing results.

CDC Worked to Improve Drinking Water in Private Wells

During 2015–2020, the National Center for Environmental Health (NCEH) within the Centers for Disease Control and Prevention (CDC) funded 19 state and local public health agencies to improve drinking water programs as part of Safe Water for Community Health. These recipients used the Environmental Public Health Performance Standards (www.cdc.gov/nceh/ehs/envphps/default.htm) to identify and address program gaps.

Based on their findings, funding recipients increased access to services for private well users by hosting outreach activities such as well owner workshops and partner meetings. They provided information on testing of well water, interpreting test results, and exploring ways to improve wells and choose treatment options. By closing program gaps, recipients were better able to help reduce private well user exposure to harmful contaminants in their drinking water. For example, recipients collected and tested 26,427 well water samples. They found that 4,346 wells serving approximately 11,000 people had high levels of contaminants. Work to reduce exposures to contaminants included repairing wells, installing new treatment systems, and in some cases, changing source water.

NCEH also supported recipient efforts to monitor water quality, improve the organization of data, develop targeted interventions, and expand tool kits. As recipients improved water quality monitoring, they enhanced their understanding of contaminants of concern and routes of exposure in the communities they served.

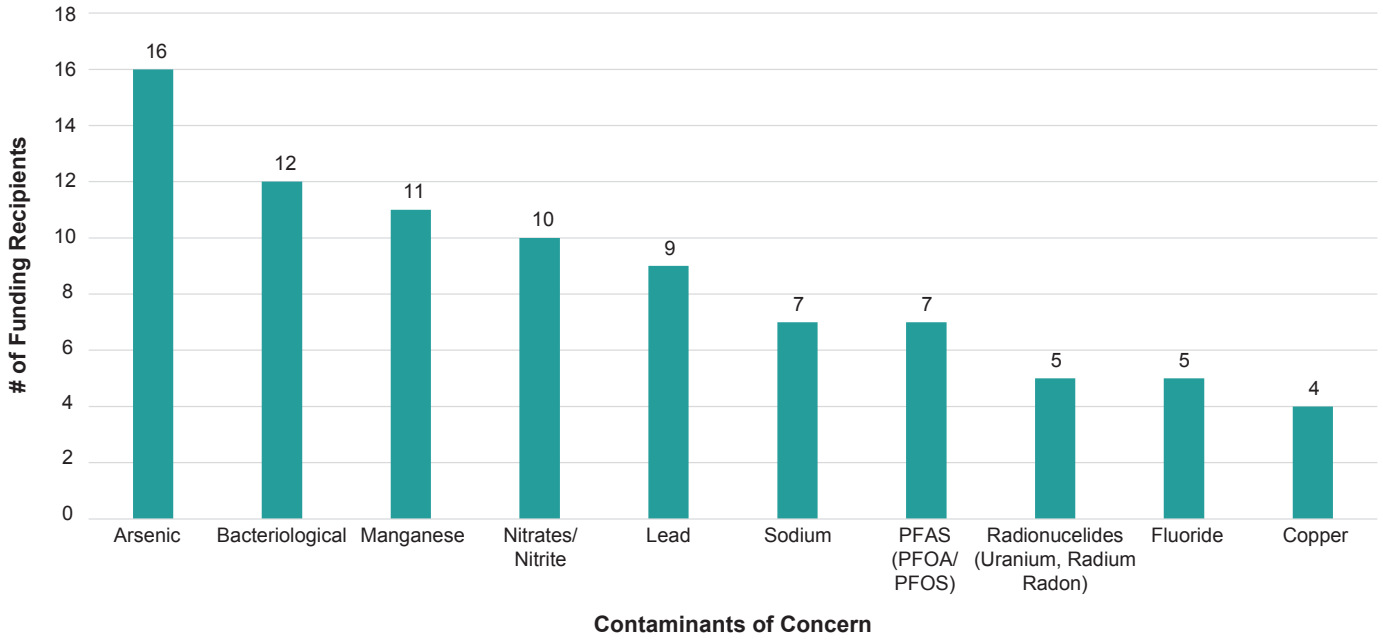
CDC Organized Information About Top Contaminants of Concern in Wells

At the close of the funding program, NCEH conducted exit interviews with recipients to learn which well contaminants were of greatest concern in their jurisdictions. Recipients provided their insights based on their improved water quality monitoring efforts. Among the top 10 mentioned (Figure 1), their top 5 contaminants of concern were:

1. arsenic,
2. bacteriological agents (*E. coli* and total coliform),

FIGURE **1**

Top 10 Contaminants of Concern Reported by Funding Recipients (*N* = 19)



Note. PFAS = per- and polyfluoroalkyl substances; PFOA = perfluorooctanoic acid; PFOS = perfluorooctanesulfonic acid.

TABLE **1**

Fact Sheets Developed by Funding Recipients to Inform Well Owners About Contaminants of Concern in Their Communities

Topic	Link
Arsenic	www.azdhs.gov/documents/preparedness/epidemiology-disease-control/environmental-toxicology/well-water/arsenic.pdf
Coliform bacteria	www.michigan.gov/documents/deq/deq-wd-gws-wcu-coliformbactiwellwatersampling_270604_7.pdf
Lead	www.oregon.gov/oha/PH/HealthyEnvironments/DrinkingWater/Monitoring/Documents/health/lead.pdf
Manganese	https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/eoha/pdf/24ResidentialDrinkingWaterWellTestingpdf.pdf?la=en
Nitrates	www.michigan.gov/documents/deq/deq-wd-gws-ciu-nitratebrochure_270430_7.pdf

3. manganese,
4. nitrates, and
5. lead.

These exit interviews also detailed how funding recipients handled challenges to providing water treatment recommendations to private well owners. Recipients said they did not always have the expertise to answer technical questions from well owners about treatment options and whether their wells could be improved. In these situations, recipients referred well owners to consult with external partners (e.g., private businesses, universities, cooperative extensions) to address treatment options. These partnerships were vital to improving access to safe water in these jurisdictions.

Fact Sheets and App Helped Well Owners Understand Water Quality Test Results

During their 5 years of private well activities, many funding recipients developed fact sheets on the contaminants affecting their communities. The fact sheets were used to inform and enable well owners to make their drinking water safer (Table 1). They provided these fact sheets at well owner workshops, during outreach events such as state fairs, and on their websites.

Many funding recipients also applied to partner with Be Well Informed (www.bewellinformed.info/about). This free tool, designed by the Environmental Council of the States, is an open-access web application that helps private well owners understand their water qual-

TABLE **2**

Funding Recipients That Use the Be Well Informed Tool

Jurisdiction	Link
Arizona	www.azdhs.gov/preparedness/epidemiology-disease-control/environmental-toxicology/well-water/index.php#be-well-informed
Massachusetts	www.mass.gov/service-details/understanding-my-laboratory-results
Michigan	www.michigan.gov/egle/Maps-Data/Be-Well-Informed
Virginia	www.wellwater.bse.vt.edu/well-informed-virginia.php
Wake County, North Carolina	www.wakegov.com/departments-government/water-quality-programs/groundwater-protection-and-wells/well-water-testing/understanding-test-results
West Virginia	https://bewellinformed.info/workbench
Wyoming	https://deq.wyoming.gov/water-quality/groundwater/know-your-well/

ity test results. When well owners from participating jurisdictions enter their water quality test results into the online application, they get easy to understand information regarding health concerns and available water treatment options. They can also learn where to obtain more information in their local area.

Many states are using the Be Well Informed tool (Table 2). Jurisdictions can customize it to suit their needs. Users report that there has been a significant reduction in the number of staff hours dedicated to answering questions about private well water testing. States interested in joining Be Well Informed can visit www.bewellinformed.info/for-partners to get started. Take a look at the Onboarding Kit first for step-by-step instructions and helpful FAQs with answers to common questions.

You can find additional resources for environmental health practitioners on private wells at www.cdc.gov/nceh/ehs/water/private-wells/index.html.

Corresponding Author: Brian Hubbard, Safe Water Section Lead, National Center for Environmental Health, Centers for Disease Control and Prevention, 4770 Buford Highway NE, Atlanta, GA 30341.
Email: bnh5@cdc.gov.

References

Centers for Disease Control and Prevention. (2022). *Private drinking water and public health*. https://www.cdc.gov/nceh/ehs/water/private-wells/private-drinking-water-public-health.html

DeSimone, L.A., Hamilton, P.A., & Gilliom, R.J. (2009). *Quality of water from domestic wells in principal aquifers of the United States, 1991–2004: Overview of major findings* [Circular 1332]. U.S. Geologic Survey. https://pubs.usgs.gov/circ/circ1332/includes/circ1332.pdf

Looking to Start or Improve Your Well Program?

Use our resources to find and address gaps in your program to protect people in your community whose water comes from private wells. Learn more at www.cdc.gov/nceh/ehs/water/private-wells/starting-a-private-well-program.html.