

# Water Through a Kaleidoscope

A Comprehensive Approach  
to Promoting Well Stewardship in Oregon



We often take safe drinking water for granted. In many parts of the country, families drink private well water that looks and tastes clean but may in fact be contaminated with harmful substances like bacteria, nitrates, and arsenic. The good news is that with routine testing, treatment, and better access to alternative water sources, we can make sure everyone has safe, clean water to drink.

The Oregon Health Authority (OHA) is one of many agencies around the country that are tackling the issue of poor water quality in private wells. This case study is part of a ChangeLab Solutions series on how state and local public health agencies can move beyond programming and begin to address policy, system, and environment (PSE) changes to improve the quality of private well water. This case study illustrates the role a state health agency can play in supporting PSE change and well stewardship, describing some of the strengths of OHA's work:

- **Pursuing several complementary strategies to address a complex health issue.** OHA helped educate and train individual well owners to be better stewards of their wells, but it also influenced policies and legislation, trained service providers on better organizational practices, and tapped county health departments to conduct community-wide education.
- **Developing skills in framing an issue to make it relevant for different audiences.** Pursuing several strategies at once meant that OHA needed other groups with different priorities to share in the work and its benefits. OHA and its partners learned over the course of this grant to talk about safe drinking water in different ways, so the benefits of testing water from private wells were clear to realtors, farmers, homeowners, landlords, and tenants.

To learn more about what other communities are doing to tackle water quality issues, visit [changelabsolutions.org/publications/closing-water-quality-gap](https://changelabsolutions.org/publications/closing-water-quality-gap).

# Introduction

Approximately 23% of people in Oregon rely on private wells for drinking water.<sup>1</sup> To ensure safe drinking water for these residents, the Oregon Health Authority promoted well stewardship through a grant from the Centers for Disease Control and Prevention (CDC). OHA used information collected through community outreach, health education, and well water testing to support implementation of the Oregon Domestic Well Testing Act.

23%

**OF PEOPLE IN OREGON RELY ON PRIVATE WELLS FOR DRINKING WATER**

---

## The Problem

Private wells are not regulated by the federal Safe Drinking Water Act, and with an estimated 350,000 active wells used for drinking water,<sup>2</sup> Oregon is one of just a few states that requires testing of private wells. When a real estate sale or exchange involves a well that supplies groundwater for household use, Oregon's Domestic Well Testing Act calls on the seller to test the water for arsenic, nitrates, and total coliform bacteria and to share the results with the buyer and OHA within 90 days of receiving the test results.<sup>3</sup>

350,000

**ACTIVE WELLS IN OREGON ARE USED FOR DRINKING WATER**

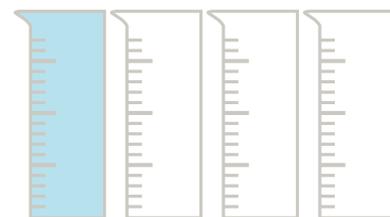
Arsenic, nitrates, and coliform bacteria have no taste, smell, or color in water and can only be detected through a laboratory test. These 3 tests are required by the Domestic Well Testing Act for the following reasons:

- High levels of arsenic in drinking water have acute and long-term health effects, including nausea, vomiting, skin lesions, and neurological or circulatory problems. Drinking arsenic-contaminated water over a long period increases the risk for some types of cancer. Arsenic occurs naturally in some groundwater from the soil and bedrock surrounding the aquifer.<sup>4</sup>
- High levels of nitrates in drinking water can reduce the blood's ability to carry oxygen in infants, pregnant women, and people with reduced stomach acidity. Plant and animal waste creates nitrates, which can also be released into the environment through smoke, industrial and car exhaust, and fertilizers, for example.<sup>5</sup>
- Total coliform bacteria provides a snapshot of water quality. Although most coliform bacteria do not cause disease, their presence suggests that pathogens such as E. coli could also be in the water. Total coliforms include bacteria commonly found in soil, surface water, and plants, as well as fecal coliforms that live in human and animal digestive tracts or waste.<sup>6</sup>

In concert with Oregon's Groundwater Protection Act, the Domestic Well Testing Act was meant to provide OHA with more information about possible groundwater contamination and to help identify areas that require additional management or regulations to prevent waterborne illness and safeguard public health. But the Domestic Well Testing Act did not include an enforcement mechanism or additional funding for OHA to analyze and make use of the test results.

As a result of the enforcement gap, well water has not always been collected and tested as part of real estate transactions and the results have not always been shared with OHA. OHA estimates it receives only one-quarter of the water test results mandated as part of real estate transactions. Well water testing has been further complicated by the following barriers:

- Some of the test results may not accurately reflect water quality, since the legislation does not require that a certified person or accredited organization collect the water samples for testing.
- The testing requirements do not apply to all wells, such as wells on any property not involved in a real estate transaction.
- General awareness of testing requirements has been limited, particularly for wells on inherited land. "We have heritage homes that are passed down from generation to generation, and the family hasn't a clue that their drinking water might have elevated levels of arsenic or nitrates," said Bill Emminger of Benton County Environmental Health, an OHA grant recipient.



**OHA RECEIVES ONLY ONE-QUARTER OF THE MANDATED WATER TEST RESULTS FROM REAL ESTATE TRANSACTIONS**



# The Project

With CDC funding, OHA set out to improve compliance with the Domestic Well Testing Act by promoting well stewardship among property owners. OHA particularly wanted to reach households whose wells are not covered by the policy, such as landlords who are not required to provide tenants with water quality results. Well stewardship involves activities such as the following:

- Testing well water according to the recommended schedule and after flooding or earthquakes,
- Inspecting wells visually for obvious signs of damage, and
- Ensuring adequate distance from wells to septic systems and from wells to storage sites for pesticides and hazardous materials.<sup>7</sup>

“Well stewardship is the idea of taking care of your own well. Because wells are unregulated, the homeowner is the first and last stop for protecting the water of their well,” said Tara Chetock of OHA. “It’s the basic practices that someone could do at home. Like how you routinely change the oil in your car, it’s making sure everything is still functioning and running well.”

OHA promoted well stewardship by making grants to counties, updating a popular resource for well owners, and working with service providers such as realtors and water testing labs. OHA informed the Oregon Environmental Council’s work on the Safe Well Water bill to improve implementation of the Domestic Well Testing Act.

## Grants to Counties

Every year, OHA awards 2 grants to counties to build local capacity for domestic well stewardship. One such grant went to Benton County, which lies in a part of the state where groundwater is known to have elevated nitrate levels. Benton County’s Environmental Health division used grant funds over 3 years to build capacity for well stewardship among homeowners. The Benton County project in turn provided OHA with more information about possible groundwater contamination, as the Domestic Well Testing Act intended, and included data for wells not involved in real estate sales or exchanges.

In the first year, the \$5,000 OHA grant paid for 90 well water tests, conducted in partnership with the Oregon State University (OSU) Extension Service Well Water Program. OSU Extension Service conducted outreach and invited people to bring well water samples to community events such as fairs and farmers markets, where the water would be tested for arsenic and total coliform bacteria at no cost to the resident. These activities raised awareness about drinking water quality and provided immediately useful information to residents about their well water, as well as a 10% discount on future well testing.

“The homeowner is the first and last stop for protecting the water of their well.”

Tara Chetock, OHA

OSU Extension Service's outreach activities were also an opportunity to recruit well owners for a Benton County Environmental Health project in which a trained OSU intern collected water samples, visually inspected the design and construction of wells, and provided additional health education. Within 1 week of the inspection, the well owner received a letter or email with the following:

- Test results
- A list of recommended actions
- A summary of the findings from the well inspection concerning well construction and safety
- Referrals to specific materials with more detailed information about water quality testing

As part of program evaluation at the end of the grant, Benton County Environmental Health contacted all the well owners with positive test results to ask what actions they took after receiving the recommendations.

The OHA grant allowed Benton County Environmental Health to work more intensively with OSU students. When one intern stayed for a full year rather than the usual 3 months, the project benefited unexpectedly. The project had a single dedicated person who was trained to inspect wells, using forms and quality control checklists; collect water samples; maintain chain of custody according to lab instructions; and document all those tasks. Having a dedicated person improved the project's efficiency and the consistency of collected data.

"Under this program, we'll have tested 149 wells, many that had never been tested before," said Bill Emminger of Benton County Environmental Health. OHA received the lab results, as well as GIS (geographic information system) locations and well tags, helping both the county and OHA better understand water quality risks. "About 3% to 4% of wells that we've tested come up positive for arsenic and nitrate that exceed the safe drinking water level. Extrapolate that for 10,000 potential wells in Benton County, and we're talking about 300–400 homeowners who don't know they're drinking contaminated water."

This experience led Benton County Environmental Health to spend part of their grant in the second year to hire an OSU intern as a part-time employee. The \$5,000 grant paid for 241 intern hours and 30 arsenic and total coliform tests of well water for vulnerable populations. "We worked closely with our health navigators and 3 clinics to get the word out to underserved, low-income, Hispanic populations. They pass on the word, and the clients contact us for testing and to enroll in the program if they're over 65, low-income, or have a preexisting medical condition," Emminger said.

.....  
"We're talking about 300–400 homeowners who don't know they're drinking contaminated water."

Bill Emminger,  
Benton County  
Environmental Health

## Well Owner's Handbook

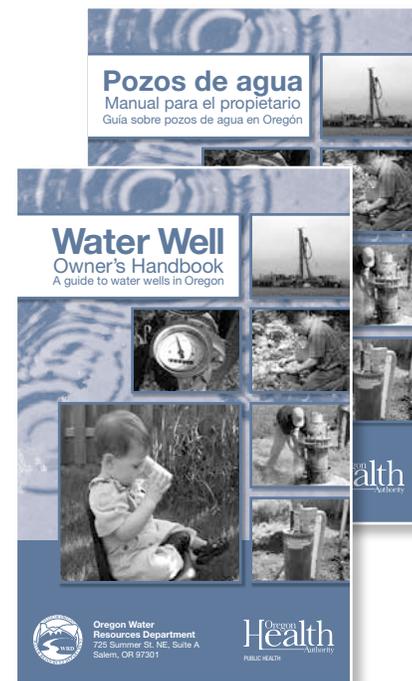
OHA also worked in partnership with the Oregon Water Resources Department to update an existing department publication, the *Water Well Owner's Handbook: A Guide to Water Wells in Oregon*. This resource includes definitions, checklists, reference tables, and a water well maintenance log.

"Our partners and stakeholders identified it as the single most referenced and used resource in Oregon," said OHA's Tara Chetock. "We said, 'If that's what everyone is using, let's update it; let's make it better.'" Some of OHA's contributions included updating the diagrams and explaining the requirements of the Domestic Well Testing Act for a lay audience. OHA also translated the *Water Well Owner's Handbook* into Spanish, along with several fact sheets on topics such as drought, arsenic, and nitrates.

## Provider Outreach and Education

OHA reached out to individuals and organizations that routinely work with well owners, including the following:

- **Realtors.** Realtors sometimes collect water samples incorrectly because they lack the proper training. OHA staff members presented to several county realtors associations through the Oregon Association of Realtors. Real estate agents were especially eager to attend the OHA webinars offered statewide in order to learn more about the Domestic Well Testing Act and earn continuing education units toward their license renewal. OHA also helped revise the well addendum included in the standard package of real estate forms.
- **Labs.** Labs perform the water quality tests required by the Domestic Well Testing Act. OHA presented at the Oregon Environmental Laboratory Association annual meeting to explore ways to streamline the process of sharing water test results with OHA. For example, would compliance increase if the lab added to its standard packet a form indicating the seller's approval to send a copy of their test results to OHA? OHA also provided 30 accredited private laboratories with the revised education materials on well water, for sharing with clients. Sharing these materials helps ensure that well owners receive consistent and clear information about well water, even when the tests are run by different labs.



# Lessons Learned

Improving services to promote and support well stewardship is a system change that makes it easier for private well owners to care for their own wells. OHA's efforts oriented toward systems change, however, have also informed policy change efforts. As OHA has attempted to work within existing laws to improve water quality, their experience has helped guide attempts to strengthen those laws.

The Oregon Environmental Council (OEC) used information collected by OHA in their effort to amend and strengthen the Domestic Well Testing Act. The Safe Well Water bill promoted by OEC initially set out to accomplish the following:

- **Extend testing to private wells on rental properties.** Previously, tests were only conducted during real estate sales or exchanges. Now, if routine testing reveals unsafe levels of arsenic, nitrates, or coliform bacteria, landlords would have to provide safe drinking water to tenants by installing an appropriate water treatment system.
- **Create a loan program for low-income well owners and landlords whose rental properties have private wells.** Loans would make it easier for property owners to install the recommended water treatment system.
- **Provide OHA, local health departments, and other organizations with funding for additional outreach, health education, testing events, and data analysis.** This bill was designed to sustain and enhance OHA's activities related to safe drinking water even after the CDC grant ended.

Since its initial introduction in 2015, the Safe Well Water bill has been amended several times to address the concerns of various constituencies. The Oregon Environmental Council and OHA have learned over 3 legislative sessions how best to frame well water testing for different interest groups, how to better address stakeholder concerns, and how to find a proper balance between those stakeholder concerns and meaningful policy change.

## Realtors

Many real estate agencies comply with the Domestic Well Testing Act to help create trust with current and future clients. "[A realtor's] business is based on reputation," said Angela Crowley-Koch of the Oregon Environmental Council. "Following through with the law is about safeguarding your reputation. You want to be known for providing accurate water quality information at the time of sale and providing a service for not only the home seller you represent but also the buyer."

However, while compliance with the Domestic Well Testing Act has helped realtors build trust with their clients, realtors have also

.....  
"You want to be known for providing accurate water quality information at the time of sale and providing a service for not only the home seller you represent but also the buyer."

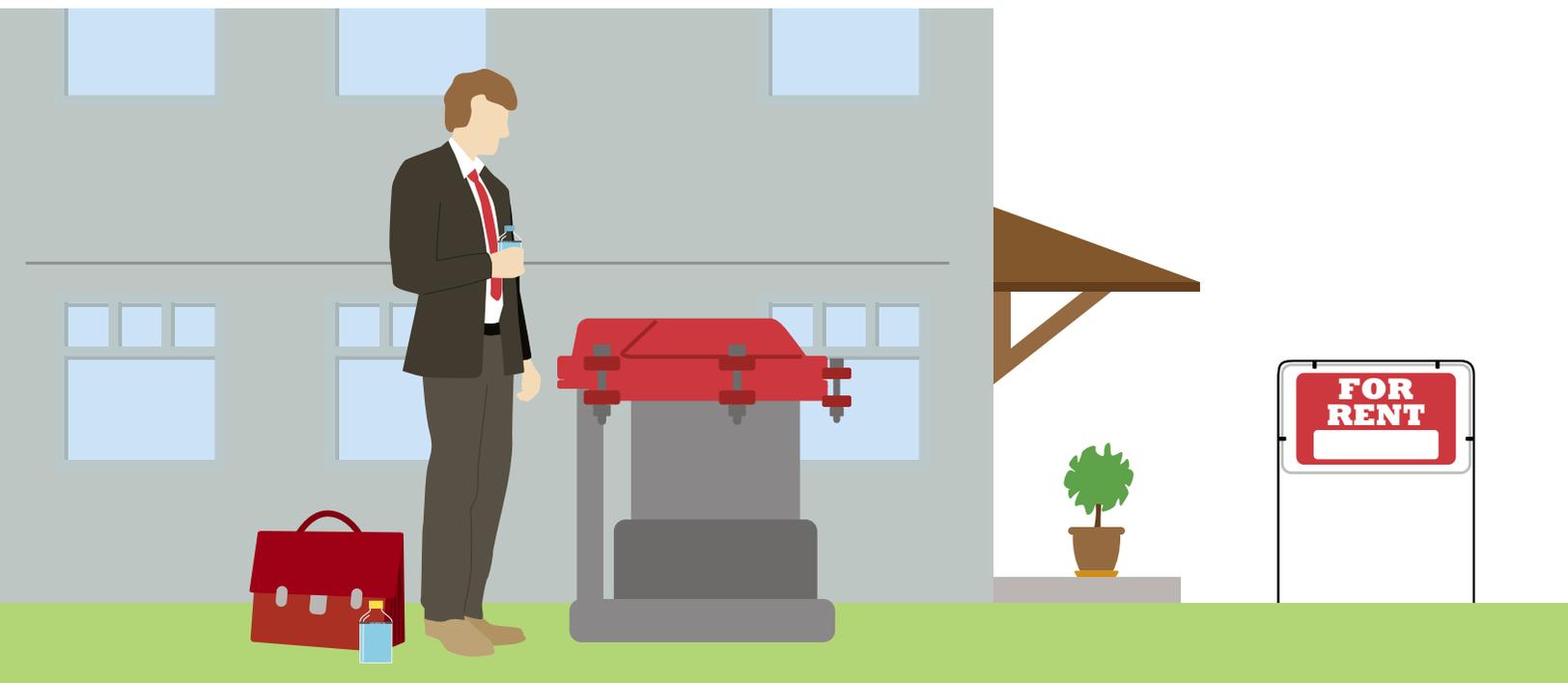
Angela Crowley-Koch,  
Oregon Environmental  
Council

expressed worry that water test results might be used as a reason to void or nullify a real estate contract. While OEC understood realtors' concern, it had to balance that concern with its larger goal of increasing compliance with the reporting requirements of the Domestic Well Testing Act. OEC ultimately amended the language of the Safe Well Water bill proposal in 2017 to include a non-compliance fee, to ensure that purchasers and OHA are informed of well-testing results.

## Landlords

Tenants have a right to know whether their drinking water is safe, but most well water quality programs focus on property owners, not tenants, and property management companies can create additional distance between tenants and landlords. During the passage of the Domestic Well Testing Act, the Oregon Landlord/Tenant Coalition, comprising several landlord and tenant rights groups, had worked to negotiate an exemption from well water testing requirements for small rental properties. Properties with 9 or fewer tenants – or 3 or fewer households – are not required to test their well water unless the property is involved in a real estate transaction. Given this history, OEC understood that rental properties would need special attention in the new Safe Well Water bill.

During the process of drafting and amending the bill, the Oregon Landlord/Tenant Coalition agreed to new testing requirements for the previously exempt small rental properties. Under the bill, owners would be required to test rental property wells for arsenic once in the lifetime of the well and disclose the result to tenants. Landlords would also be required to test well water for nitrates and E. coli every year, unless the water sample had no nitrates or bacteria for 3 years in a



row, after which the landlord could switch to a schedule that requires testing only every 5 years. Though the Safe Well Water bill with this proposed agreement has not yet been enacted into law, OEC was able to successfully negotiate a new set of testing requirements for small rental properties with the Landlord/Tenant Coalition by drafting language designed to save landlords expense and trouble, particularly landlords of rural or isolated properties, who expressed concern about the difficulty and expense of finding professionals to conduct well tests and getting water samples tested at accredited labs located far away.

## Farmers

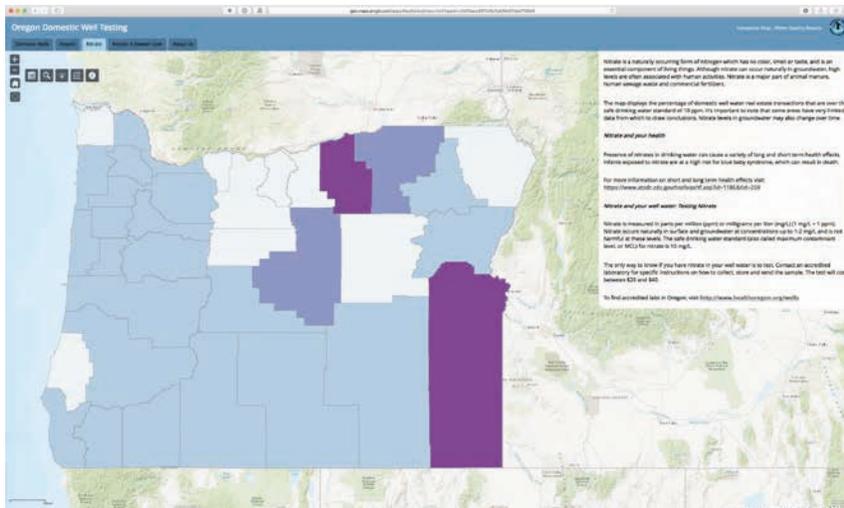
The agriculture industry in Oregon can be sensitive about water issues, so it is important to include farming representatives and address their concerns, even for bills that don't appear to directly affect them. When the Oregon Landlord/Tenant Coalition negotiated testing requirements for private wells on rental properties, for example, farmers were not part of the conversation because the testing requirements did not apply to temporary farmworkers' housing. But when farmers learned of the bill, the Oregon Farm Bureau convinced legislators to block the bill's passage for 1 year because farmers wanted more time to investigate repercussions for agriculture businesses and weigh in.

"The heart of this issue for the Farm Bureau is this feeling that farmers are always blamed for contamination [from livestock and fertilizers], even when it's not their fault," OEC's Crowley-Koch said. As a result of this experience, the Oregon Environmental Council learned to include farmers' interest groups early in the process for any bill related to water quality, surface water, or well water, as well as identify champions for clean drinking water within the farming community.



# Next Steps

As part of ongoing efforts to increase compliance with the Domestic Well Testing Act, OHA recently launched [a new application on its website](#) for well owners to submit the results of water quality tests and the required Domestic Well Testing Act form directly to OHA. This simplified procedure - another systems change - should be easier for well owners than downloading a separate form and emailing the completed version to OHA, and the labs have agreed to spread the word to customers.



Since this CDC-funded project, OHA has also created [an online map](#) of its well data that's easy to navigate and use. This online map uses available data on well-testing results, making data about potential contaminants available to residents and other people interested in water quality who may not be professionals. OHA has also been working to update its internal database to enable seamless entry and retrieval of water quality data.

OHA will continue its partnership with OSU to identify effective outreach techniques to increase water testing and remediation rates among renters, low-income homeowners, and other groups. For example, OHA and OSU developed a focus group protocol to measure knowledge, beliefs, and attitudes of well owners, as well as questionnaires for private well users and institutions involved in the program. Through focus groups and surveys, OHA hopes to identify gaps in services as well as people's misconceptions about private wells.

# Acknowledgments

This case study was written by Benita Tsao with input from Rebecca Johnson, Heather Lewis, Gregory Miao, and Brock Winstead. Additional support was provided by Carolyn Uno, Kim Arroyo Williamson, and Heather Wooten. All are affiliated with ChangeLab Solutions.

This case study would not have been possible without the inspirational work of the Oregon Health Authority and its partners. Many thanks are due to the following people for participating in interviews and reviewing drafts of this case study:

- Benton County Environmental Health – Bill Emminger
- Domestic Well Safety Program, Oregon Public Health Division – Tara Chetock and Curtis Cude
- Drinking Water Program, Oregon Health Authority – Dave Leland
- Oregon Association of Realtors – Jenny Pakula
- Oregon Environmental Council – Angela Crowley-Koch
- Waterlab Corporation – Beth Myers

Additional thanks go to Brian C. Hubbard, MPH, health scientist at the Centers for Disease Control and Prevention’s National Center for Environmental Health.

ChangeLab Solutions is a nonprofit organization that provides legal information on matters relating to public health. The legal information in this document does not constitute legal advice or legal representation. For legal advice, readers should consult a lawyer in their state.

This publication was supported by Grant or Cooperative Agreement Number 5U38OT000141-03 awarded to ChangeLab Solutions and funded by the Centers for Disease Control and Prevention. The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the US Department of Health and Human Services.

© 2018 ChangeLab Solutions

Design & Illustrations:  
Karen Parry | Black Graphics

---

## Notes

1. Oregon’s Domestic Well Safety Program. Oregon Health Authority website. [public.health.oregon.gov/HealthyEnvironments/DrinkingWater/SourceWater/DomesticWellSafety/Pages/index.aspx](http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/SourceWater/DomesticWellSafety/Pages/index.aspx). Accessed June 1, 2017.
2. Basic Information About Private Wells. Oregon Health Authority website. [public.health.oregon.gov/HealthyEnvironments/DrinkingWater/SourceWater/DomesticWellSafety/Pages/Basic-Info.aspx](http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/SourceWater/DomesticWellSafety/Pages/Basic-Info.aspx). Accessed June 1, 2017.
3. Or. Rev. Stat. § 448.271. The 1989 statute required testing only for bacteria and nitrates. The law was amended in 2009 to add an arsenic testing requirement.
4. Chemical Contaminant Rules. U.S. Environmental Protection Agency website. [www.epa.gov/dwreginfo/chemical-contaminant-rules](http://www.epa.gov/dwreginfo/chemical-contaminant-rules).
5. Chemical Contaminant Rules. U.S. Environmental Protection Agency website. [www.epa.gov/dwreginfo/chemical-contaminant-rules](http://www.epa.gov/dwreginfo/chemical-contaminant-rules).
6. Revised Total Coliform Rule and Total Coliform Rule. U.S. Environmental Protection Agency website. [www.epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule](http://www.epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule).
7. Oregon Water Resources Department & Oregon Health Authority (2015 June). Water Well Owner’s Handbook: A Guide to Water Wells in Oregon.