

# STATE OF CONNECTICUT

## DEPARTMENT OF PUBLIC HEALTH



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### EHS Circular Letter # 2013-11

TO: Local Health Departments

FROM: Brian Toal, Supervising Epidemiologist 4

DATE: March 3, 2013

RE: Testing for Arsenic and Uranium in Private Wells

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Attached for your use are two fact sheets on [arsenic](#) and [uranium](#) in private well water. These are revisions to existing fact sheets for both metals. The major changes strengthened our recommendations about testing private wells for these contaminants. We strongly recommend that all private wells in Connecticut be tested for arsenic and uranium at least once, and ideally every five years since the levels can vary over time. Additionally, we suggest that it is a good idea to test when a new well is drilled, when a house is sold and when an existing well is hydro-fracked.

In the past we suggested homeowners test for these compounds if they wanted to know whether their well was contaminated. We did not clearly recommend testing, as we did not have statewide data that indicated a widespread problem with these naturally occurring metals. However, in recent years we have received a number of reports of clusters of private wells with uranium and arsenic levels higher than federal standards set for public water systems. Based on these increased reports, we felt it was time to strengthen our recommendations.

Recent arsenic reports have come from the northern and southwestern parts of the state. Previous arsenic reports came from the eastern part of the state. Uranium has been a documented problem in a number of towns in western Connecticut and a significant problem in south central Connecticut. Although we cannot determine with any certainty which areas of the state may have more of a risk than others, we find it prudent to recommend testing in all parts of the state.

As part of the new well approval process, you may want to request a test for these two contaminants. We also hope that these two fact sheets will help to educate your residents about potential risks and encourage voluntary testing. The cost for testing is fairly inexpensive (approximately \$50.00 each) and many private [environmental labs](#) are capable of conducting the analysis.



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In the uranium fact sheet there is a discussion about radium testing. (There is also a revised radium fact sheet) Radium is sometimes found in association with uranium. At this time we do not recommend widespread testing for radium. The data does not indicate that it is a common problem, testing costs for radium are expensive (approximately \$200.00) and many uranium treatment methods also remove radium.

If you have any questions about this information, please call me at 860-509-7741.

cc: Suzanne Blancaflor, M.S., M.P.H., Chief, DPH Environmental Health Section  
Ellen Blaschinski, R.S., M.B.A., Chief, DPH Regulatory Services Branch



# PRIVATE DRINKING WATER IN CONNECTICUT

Publication Date: January 2013

## ***Publication No. 3: Arsenic in Private Drinking Water Wells***

Arsenic is a metal that has no smell or taste. Arsenic is naturally present in bedrock in many places throughout CT. When a drinking water well is drilled into bedrock containing arsenic, the arsenic can get into the well water. We know that there are private wells in locations across CT with high levels of arsenic. The only way to find out if your well has high arsenic is to test. We recommend that homeowners test their private well at least once for arsenic. This fact sheet provides homeowners with information about the health effects from arsenic, how to test well water for arsenic and what to do if your well water has high levels of arsenic.



### **How Does Arsenic Get Into Drinking Water & How Can I Find Out If My Well Is Contaminated?**

Depending on local environmental conditions, arsenic can leach from soils or mineral deposits into groundwater. However, the extent to which this occurs in Connecticut bedrock wells is uncertain. A survey in Eastern Connecticut<sup>(1)</sup> found that contamination is not widespread, but also, not predictable. Therefore, the only way to know if your well is contaminated is to test the water.

### **What Are The Potential Health Effects Of Arsenic In Drinking Water?**

The EPA and expert scientific committees have classified arsenic as a human cancer-causing agent. Research indicates that people living in areas where water concentrations are very high are more likely to have bladder, lung, or skin cancer. They are also more likely to have problems with their skin, and with their cardiovascular, immune and neurological systems. These toxic effects of arsenic exposure developed after many years of exposure.

Usually, arsenic contamination is measured in units of milligrams per liter (mg/l), which is equivalent to parts per million (ppm). Otherwise, the units may be micrograms per liter (ug/l), which is equivalent to parts per billion (ppb), and 1000 times lower than ppm.

### **How Much Arsenic Is Safe To Drink?**

The Federal government sets safe drinking water standards for public water. The EPA drinking water standard for arsenic (i.e., the Maximum Contaminant Level, or MCL) is 0.01 mg/l (10 ug/l; 10 ppb). The Department of Public Health supports 0.01 mg/l as a health-based guideline for private wells.



Produced by The State of Connecticut Department of Public Health  
Environmental Health Section, Private Well Program  
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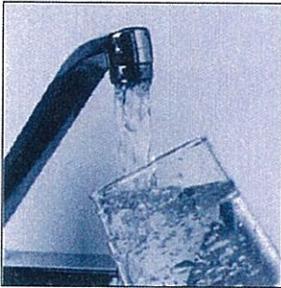
### **Where Can I Have My Well Water Tested For Arsenic?**

You can have your water tested at any state-certified water testing lab. A current list of certified labs can be obtained from your local health department, or from the [DPH Environmental Labs](#) web site.



### **I Just Found Out I Have High Arsenic Levels In My Water: What Should I Do?**

If your water has more than 0.01 mg/l arsenic (the EPA public water standard), we recommend you consider bottled water or a treatment system to purify tap water for drinking and cooking. It is safe to wash in arsenic contaminated water because very little arsenic gets into your body through the skin. It is also safe to use the water for other chores (laundry, gardening, etc.).



### **Is There A Way To Remove Arsenic From Well Water?**

Removal of arsenic from well water can be a complicated process. If your water has high arsenic, we recommend that you consult a knowledgeable water treatment specialist. There are several treatment technologies that can remove arsenic from well water. These technologies include metal oxide filters, ion exchange systems and reverse osmosis systems. However, the chemical parameters of your well water and the chemistry of the arsenic present in your water will dictate which treatment technology will effectively remove the arsenic. This is why it is important to involve a water treatment specialist.

Because it is not necessary to treat all of the water in your house, treatment needs can be met by installing a “point of use” treatment system at a convenient location at the kitchen sink, or the water tap on the refrigerator and icemaker. When deciding on a treatment system, consider both the initial cost and the operating costs. Operating costs include the energy needed to operate the system, additional water that may be needed for flushing the system, consumable supplies and filters, repairs, and general maintenance. Information on specific water treatment products is available from the [National Sanitation Foundation](#) (NSF). Staff from the Private Well Program of the Department of Public Health (860-509-7296) are also available to answer questions about treatment options.

### **What Are Some Other Sources Of Arsenic?**

According to results of the Food & Drug Administration (FDA) total diet study,<sup>(2)</sup> on average, the amount of inorganic arsenic in your food is equivalent to drinking one to two liters of water containing 0.005 mg/l of arsenic. Though some types of seafood contain high amounts, the form of arsenic in seafood is not known to be toxic.

### **Is There A Medical Test That Will Tell Me If My Body Has Too Much Arsenic?**

Although there are tests for urine and hair, results from these tests are difficult to interpret and, according to the American Medical Association,<sup>(3)</sup> are unreliable. Therefore, the best way to find out if you are being exposed to excessive amounts of arsenic is to test the well water you drink.

### **References**

1. Brown, C & Chute S. (2002). Arsenic Concentrations in Bedrock Wells in Colchester, East Hampton, and Woodstock CT. US Geological Survey, Water Investigations Report 02-4135.
2. National Research Council (1999). Arsenic in Drinking Water. National Academy Press, Washington DC. Pp 46-51.
3. Siedel, S., et al. (2001). Assessment of Commercial Laboratories Performing Hair Mineral Analysis. Journal of the American Medical Association: Vol 285, #1, 67-72.

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**When Should I Test My Well for Arsenic?**

You should test for arsenic when you buy a house with a well or at the time a new well is drilled. It is possible for arsenic levels in well water to fluctuate so even if one arsenic test shows no arsenic problem, it is a good idea to test for arsenic every 5 years. If you have a treatment system to remove arsenic from your water, you should test every year to be sure your treatment system is working properly.

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**For more information about arsenic, well water testing and treatment:**

[Arsenic ToxFAQ](#)

DPH Publication #19, [Questions to Ask When Purchasing Water Treatment Equipment](#)

DPH Publication #24, [Residential Drinking Water Well Testing](#)

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**For Health Questions:**

CT Department of Public Health

[Environmental & Occupational Health Assessment Program](#)

(860)509-7740

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**For Treatment Questions:**

For technical advice on well water construction, maintenance, quality or treatment, contact your [Local Health Department](#) or the Department of Public Health, [Private Well Program](#) at 860-509-7296.

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**Certified Testing Labs:**

Go to the [DPH Environmental Labs](#) web page.

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**For more information:**

[EPA Office of Groundwater and Drinking Water](#)

[EPA New England](#)



# FACT SHEET

February 2013

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## WHAT YOU NEED TO KNOW ABOUT Uranium in Private Well Water

Uranium is a metal that has no smell or taste. Uranium is naturally present in bedrock in many places throughout CT. When a drinking water well is drilled into bedrock containing uranium, the uranium can get into the well water. We know that there are private wells in locations across CT with high levels of uranium. The only way to find out if your well has high uranium is to test. We recommend that homeowners test their private well at least once for uranium. This fact sheet provides homeowners with information about the health effects from uranium, how to test well water for uranium and what to do if your well water has high levels of uranium.

### What is “Natural” Uranium ?

Uranium is an element that has been in rocks since the earth was formed. Not all rocks contain uranium, but there are some places in the world where uranium is in the bedrock. Other related elements that may be found in association with uranium include radium (Ra-226 and 228) and radon (Rn-222). These other elements are part of a sequence formed through a transformation (decay) process that begins with the most prevalent form of “natural” (unprocessed) uranium (U-238). U-238 is not radioactive enough to be useful in nuclear power plants or weapons. In fact, “Enriched” uranium used in power plants, needs to have most of the U-238 taken out.

### Is There Uranium in My Well Water?

Uranium occurs naturally in some Connecticut bedrock ground water, therefore deep bedrock wells are susceptible to contamination. Shallow wells that do not reach bedrock are less susceptible to uranium contamination. Wells with high levels of uranium have been found sporadically all around Connecticut. Uranium gets into well water from bedrock that contains uranium. The amount of uranium in bedrock and well water will vary greatly from place to place and without testing, it is not possible to determine if the water can be considered safe for drinking.



### How Can Uranium Affect My Health?

The chemical properties of uranium in drinking water are of greater concern than its radioactivity. Most ingested uranium is eliminated from the body. However, a small amount is absorbed and carried through the bloodstream. Studies show that drinking water with elevated levels of uranium can affect the kidneys over time. Bathing and showering with water that contains uranium is not a health concern.

### How Can I Make Sure That My Well Water Safe For Drinking?

Uranium testing should be your first step. Based on the results, your decision will be to either install a treatment system, or do some additional testing for related contaminants. To find out if you have uranium in your drinking water, the Connecticut Department of Public Health (DPH) recommends that you contact a laboratory and ask for a uranium test using “atomic absorption” or “ICP-MS”. These tests are quicker and less expensive

than other alternatives. DPH maintains a list of [State-certified laboratories](#). Search the document for labs testing “radiochemicals” in drinking water (code R). A uranium test costs about \$50.

If you have uranium in your well water at a concentration greater than the EPA standard of 30 micrograms per liter (ug/l), you will need to treat your water to remove the uranium. See the section below for information on treatment.

Radium is another naturally-occurring metal that can contaminate well water and is sometimes associated with uranium problems. Testing for radium is an option you can consider if test results indicate that you do not have a uranium problem. A radium test costs about \$200. You do not need a radium test if you have already decided to install a uranium treatment system, provided the uranium treatment system will remove radium in addition to uranium. For more information about radium, refer to the DPH Factsheet [Naturally Occurring Radium in Private](#)

## When Should I Test My Well For Uranium?

You should test for uranium when you buy a house with a well or at the time a new well is drilled. It is possible for uranium levels in well water to fluctuate so even if one uranium test shows no uranium problem, it is a good idea to test for uranium every 5 years. If you have a treatment system to remove uranium from your water, you should test every year to be sure your treatment system is working properly.

## Water Treatment for Uranium

Point-of-use (POU) water treatment devices treat water at just one faucet. They differ from point-of-entry (POE) devices, which are installed on the water line as it enters the home and treat all the water that enters the home. Because uranium gets into your body only through ingestion (and not through the skin or through inhalation), it is not necessary to treat all the water in your home, but only the water you drink.



Reverse osmosis (RO) and ion exchange are the most common types of treatment systems used for uranium removal and are both very effective. Both types of treatment can be installed as POU or POE systems. However, there are other technologies that will remove uranium as well. Decisions about treatment systems depend on many factors, including what else is in your water, water usage, installation costs and maintenance costs. You should consult a water treatment expert to help you decide what treatment system is best for your situation. Another source of information is [NSF International](#) which certifies many water treatment devices.

You should also think about whether the uranium treatment system you are considering will also remove radium. If you need to treat your water because of high uranium and the system you select will also remove radium, then you do not need to test your water for radium. However, if your uranium treatment system is not effective for radium, we recommend that you test your water for radium. If you have elevated radium in addition to uranium, you will need to select a system that will effectively remove both contaminants.

## For More Information

### Health Questions:

CT Dept. of Public Health Environmental Health Section  
[Environmental & Occupational Health Assessment Program](#)  
(860) 509-7740

### Treatment Questions:

For technical advice on well water construction, maintenance, quality or treatment contact your [Local Health Department](#) or the Department of Public Health, [Private Well Program](#) at 860-509-7296.

**Certified Testing Labs:** DPH [Environmental Laboratories](#)

If you require aid/accommodation to fully and fairly enjoy this publication, please contact 860 - 509 -7740.



DEPARTMENT OF PUBLIC HEALTH  
 ENVIRONMENTAL LABORATORY CERTIFICATION PROGRAM  
 LIST OF CERTIFIED LABORATORIES CERTIFIED TO TEST ARSENIC (As) URANIUM (U)

Lab Name	Town	Public Health Registration #	Telephone #	Certified for Testing
Analytical Consulting Technology, Inc.	Waterbury	PH - 0518	(203) 757-3960	As
Aqua Environmental Lab	Newtown	PH - 0787	(203) 270-9973	As
Averill Environmental Lab, Inc.	Plainville	PH - 0513	(860) 747-0676	As
Complete Environmental Testing, Inc.	Stratford	PH - 0116	(203) 377-9984	As, U
Connecticut Testing Laboratories	Meriden	PH - 0547	(203) 634-3731	As
Environmental Consulting Lab	Madison	PH - 0535	(203) 245-0568	As, U
Environmental Monitoring Lab	Wallingford	PH - 0509	(203) 284-0555	As
Fallon Water Analysis, Inc.	Tolland	PH - 0525	(860) 871-2529	As
Greenwich Health Department Laboratory	Greenwich	PH - 0703	(203) 622-7843	As
Hydro-Technologies	New Milford	PH - 0627	(860) 355-8773	As
Northwest Environmental Water Labs	Waterbury	PH - 0537	(203) 437-4110	As
Phoenix Environmental Laboratories, Inc.	Manchester	PH - 0618	(860) 645-1102	As
Premier Laboratory, INC.	Dayville	PH - 0465	(860) 774-6814	As, U
Regional Water Authority	New Haven	PH - 0411	(203) 401-2700	As
York Analytical Laboratories, Inc	Stratford	PH - 0723	(203) 325-1371	As

Updated: April 4, 2013