

USGS Scientific Investigations Report 2011-5013, *Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts: Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps* has been released today. MassDEP, USGS, and MDPH have also released a joint press release regarding the results of the USGS investigation. The press release text is provided at the end of this message.

The MassDEP Drinking Water Program has dedicated a web page to the arsenic and uranium study and associated issues: [Arsenic & Uranium Bedrock Well Study](#). Here the private well owner can find the following information:

- Link to the USGS report
- Summary of the investigation and its findings
- Answers to frequently asked questions
- On-line mapping tool for obtaining information regarding the probability that a bedrock well may contain arsenic or uranium at concentrations exceeding the public drinking water standards
- Town-scale maps showing arsenic and uranium in bedrock well water probability zones
- Information regarding how to find laboratories that test for arsenic and radionuclides and drinking water treatment options
- MDPH contact information for questions regarding health effects
- Link to a fact sheet developed by MDPH that provides health effects information for arsenic and uranium in drinking water and summarizes results of a companion effort that offered urine testing for arsenic and uranium to selected households who participated in the private well study
- Link to USDA Rural Development web site where very low-income residents of rural communities can find information regarding loans or grants that may be available for installing water treatment systems
- Links to the EPA web site for additional information regarding arsenic and radionuclides in drinking water

Based upon the results of the study, USGS estimates that approximately 5,700 residential bedrock water supply wells in the study area may have arsenic concentrations that exceed the public drinking water standard for arsenic of 0.010 milligrams per liter (mg/L). USGS also estimates that approximately 3,300 bedrock wells may exceed the uranium standard of 0.030 mg/L.

On the [Arsenic & Uranium Bedrock Well Study](#) web page click on the link to “Lookup by Location” to obtain .pdf maps of the arsenic and uranium in bedrock aquifer probability zones for your town. You will find that 7402.5 acres of Northborough are mapped as having a 1% or greater probability of exceeding the drinking water standard for arsenic in any individual bedrock well and 5409.9 acres are mapped as having a 1% or greater probability of exceeding the standard for uranium. There are also 5.5 acres of your town that are mapped as having granite or pegmatite bedrock for which no probability statistics are available but are rock types that generally have an increased probability of containing well water with radon, radium, and uranium at concentrations exceeding public drinking water limits.

Contacts:

For questions regarding the USGS report contact John Colman, USGS at [JaColman@usgs.gov](mailto:JaColman@usgs.gov) or (508) 490-5027.

For questions regarding health effects of arsenic and uranium contact MDPH at (617) 624-5757 or (800)-240-4266.

For questions regarding arsenic treatment contact Joe Cerutti, MassDEP at [Joseph.Cerutti@State.MA.US](mailto:Joseph.Cerutti@State.MA.US) or (617) 292-5859.

For questions regarding radiological treatment contact Steve Hallem, MassDEP at [Stephen.Hallem@State.MA.US](mailto:Stephen.Hallem@State.MA.US) or (617) 292-5681.

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## Press Release for USGS Study on Arsenic and Uranium

**U.S. Geological Survey  
U.S. Department of the Interior  
Massachusetts Department of Environmental Protection  
Massachusetts Department of Public Health**

**Federal study maps concentrations of arsenic and uranium  
in private bedrock well water in Massachusetts**

*State agencies take action to inform residents about well water testing and, if needed, treatment options*

**To determine any risk in your area, and to get advice on testing and information on the potential health effects of arsenic and uranium, visit the Massachusetts Department of Environmental Protection at: <http://mass.gov/dep/water/drinking/au/auocate.htm>**

The U.S. Geological Survey (USGS) today released a study, which indicates that levels of naturally occurring arsenic and uranium exceed drinking water standards in some private drinking water wells in central and northeastern Massachusetts. State officials are working with USGS to develop resources that will help private well users determine whether their water meets federal safety standards, and provide guidance on water testing and treatment if it does not.

“Based on information available on water testing results, the probability that an individual’s well poses an immediate health concern is low,” said Commissioner John Auerbach of the Massachusetts Department of Public Health (MDPH). “Based on the MDPH companion effort testing for arsenic and uranium in urine, no immediate public health threat is present, and households do not need to stop using their water. At the same time, the USGS report indicates that it is prudent for private well owners to have their wells tested.”

USGS researchers analyzed water samples from 478 private bedrock wells in 116 area cities and towns and found that 13 percent exceeded federal drinking water standards for arsenic, and 3 percent exceeded standards for uranium. Both arsenic and uranium are found naturally in some types of bedrock in the study area.

The Massachusetts Department of Environmental Protection (MassDEP) and the MDPH provided funding and assistance to complete this study, and are providing health and water treatment information to health officials in each town with a higher probability of contamination from bedrock sources.

In estimating how widespread the issue is, researchers plotted the tested wells on a map showing types and extent of bedrock in the study area to relate concentrations of arsenic and uranium to bedrock type. They then plotted the remaining wells and estimated that about 5,700 of the estimated 90,000 wells in the study area may exceed the standard for arsenic, and about 3,300 may exceed the standard for uranium. Depending on rock type, the probability of exceeding a standard ranges from less than 1 percent to 26 percent for arsenic, and from less than 1 percent to 21 percent for uranium.

The federal public drinking water standard for arsenic is 10 micrograms per liter. The standard for uranium is 30 micrograms per liter. Public drinking water concentration standards for arsenic and uranium are set at low levels that can account for even those health risks associated with decades of regular consumption. Long-term exposure to arsenic above the standards can cause darkened patches of skin on the body and has been linked to skin, bladder, and lung cancer. Long-term exposure to uranium in drinking water can damage the kidneys. Based on information available on water testing results and the MDPH companion effort testing for arsenic and uranium in urine, the probability that anyone’s well poses an acute health concern is very low.

Public water supply wells that serve residences are routinely monitored for arsenic and uranium and, if necessary, they have been treated to put those sources into compliance with the standards.

The USGS study is the first detailed look at the distributions of arsenic and uranium in 116 communities within the Massachusetts portion of the New England “arsenic belt,” a swathe of naturally occurring arsenic in bedrock stretching from Dudley to Salisbury. Bedrock wells are a significant source of groundwater in the area. USGS led the study to help site future public water supplies as demand for groundwater grows in the arsenic belt, and to inform private well owners following the recent adoption of new federal drinking water safety standards.

“Most bedrock wells in Massachusetts have good water quality,” said USGS scientist John Colman, who led the study. “But bedrock wells can be subject to local sources of contamination, and, in certain rock formations, to natural sources of arsenic or uranium in the rock. This study maps the likelihood of contamination from these natural sources.”

Although private wells are not subject to the same regulatory standards as those set for public drinking-water supplies, it is recommended for health purposes that private well owners use these standards to guide their treatment decisions.

The USGS data indicated that most of the wells in the study that exceeded the safety standards were used for drinking water without treatment. Since testing and treatment are the responsibility of private well owners, Massachusetts officials strongly recommend that the owners have their wells tested and treat their water if necessary.

“The USGS predictive study confirms that concentrations of arsenic and uranium above public drinking water standards can occur within private wells in the study area of central and northeastern Massachusetts,” said MassDEP Commissioner Kenneth L. Kimmell. “I encourage residents in these areas to get their well water tested and, if necessary, install treatment systems on their water supply.”

MDPH provided private well location data for use by USGS. MDPH also offered urine analysis for arsenic and uranium to selected households who participated in the USGS well water testing program.

“While only a small number of individuals participated in the MDPH urine testing, it is reassuring to know that none of the individuals tested had levels of arsenic or uranium in their urine at a level of health concern. MDPH strongly encourages private well owners to have their well water tested and to follow the standards for public drinking water supplies to ensure that exposure opportunities do not present health concerns,” said MDPH Commissioner Auerbach.

Well users can determine the probability of their wells being contaminated by arsenic or uranium by looking at maps in the study report or using the MassDEP web site at: <http://mass.gov/dep/water/drinking/au/aulocate.htm>. Also on that site is a link to arsenic and uranium health effects information from MDPH and a summary of the urine testing results, information regarding treatment options that are available for wells with levels above the drinking water standard, and additional information from U.S. EPA regarding health effects and water treatment issues.

Residents seeking more information may also dial 211, or if their phones do not recognize this number, they may dial 1-877-211-6277 to reach the line. The TTY line is 508-370-4890.

The report “Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts – Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps” is posted online at: <http://pubs.usgs.gov/sir/2011/5013/>.

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