

# It's *YOUR* Health!



## PRIVATE WELL INFORMATION SHEET EARTHQUAKE RESPONSE

Earthquakes are not unknown in Virginia; for example, significant earthquakes occurred in 2003 and 2011. Following an earthquake, private well users may notice changes in the appearance of their water or may have concerns about the quality of their water supply (discoloration caused by sediment or minerals in the water is not uncommon).

An obvious concern is that surface water with bacteria, chemicals or other pollutants may have gotten into the well. A less obvious concern is electrical shock if a non-submersible pump or any part of the well electrical system is damaged. After an earthquake, well users are advised to not drink the water from the well or use it for washing until the integrity of the supply is established.

VDH advises well owners to Plan – Check – Act

# PLAN

Plan ahead by:

- Maintaining a supply of bottled drinking water sufficient to last your family for three days. One gallon per person per day is suggested for drinking and hygiene purposes. (see [www.ready.gov](http://www.ready.gov) for additional information for preparation of a basic emergency kit).
- Maintain a list of contact information (VDH, Water Well and Septic professionals, treatment system providers).

# CHECK

Following an earthquake, users should, at a minimum:

- Visually inspect the well for obvious signs of damage, maintaining a safe distance to avoid electrical shock from the well if the wellhead has moved laterally, or appears broken.
- Observe the water for discoloration, odor, or other sign of potential adverse effect.

# ACT

- Well users who observe discoloration in the water supply should use an alternate source of water until the water supply is clear.
- If in doubt regarding water quality, the water may be boiled before use or residents may consider using bottled water.
- If your water is cloudy or muddy, the well and waterlines should be flushed until the water has cleared. Check that grit is not preventing toilet valves from fully closing, which can overload your onsite sewage treatment system.
- Users may also use “shock chlorination,” which is a process of disinfecting a private water supply and plumbing system by circulating a concentrated chlorine solution throughout the system.
- Contact a qualified well contractor or pump installer for assistance in repair if necessary.
- ***If the discoloration persists, or if well users have concerns about contamination or structural integrity of the well they should contact a licensed professional to inspect the structure, test the water and treat if necessary.***

Note: Your local health department can assist well users with the chlorination and/or boiling procedures, which can also be found at the following links:

- [http://www.wellwater.bse.vt.edu/files/SHOCK442-663\\_PDF.pdf](http://www.wellwater.bse.vt.edu/files/SHOCK442-663_PDF.pdf)
- <http://www.vdh.virginia.gov/ODW/BoilingWaterFAQ.htm>

### **What if the Worst Happens?**

In the event that seismic damage is sufficient to render a well inoperable and beyond repair, the well must be taken out of service (abandoned) and a new well installed. Your local health department can guide you through the process.

### **A Note Regarding Onsite Sewage Systems**

Following an earthquake, the users of onsite sewage systems should check the structural integrity of system components, especially if you notice wet spots, sewage odors, or disruptive sounds made by mechanical components of your system.

Depending on your location and the type and construction of your onsite sewage treatment system, an earthquake may crack one or more of your system's tanks, damaged important mechanical components, shifted components out of proper level or alignment, or broken or crushed connecting pipes and electrical cables.

For all systems, look for changes in how your system functions, looks, sounds, or smells. Be on the alert for a change in how well household toilets flush and drains drain, the sudden appearance of wet or unusually green spots in your yard, and/or the emanation of different or more intense odors from your system.

For systems with mechanical components (blowers, pumps, etc.), look for activated alarm lights and buzzers and/or a change in how the mechanical components of your system sound.

One problem often reported following an earthquake is due to grit that enters a water well after an earthquake. If that grit makes its way through your household plumbing to your toilet, it can jam in the float valve – keeping that valve from closing when the tank is full. The extra flow of water can overload your onsite sewage treatment system, contributing to a failure long after the earthquake occurred.

### **Additional Information**

For more information about specific concerns regarding private wells or onsite sewage systems, contact your [local health department](#), your Water System Installer or your Onsite Sewage System Operator. Additional resources on private well water, onsite sewage systems are available at the following locations:

- [Centers for Disease Control and Prevention](#)
- [National Ground Water Association](#)
- [Virginia Certified Laboratories](#)
- [Virginia Master Well User Network](#)

## Interesting...

The most common type of observed ground-water response to an earthquake is an instantaneous water-level offset, or step, which may be either an increase or a decrease and may occur near or far from the epicenter. Recovery to the pre-earthquake water level can be so rapid that no change will be detected if the water level is measured infrequently, or it may take as long as days or months. Steps can be large enough to make a well flow at land surface, or render it dry. The 1998 M5.2 Pymatuning earthquake in northwestern Pennsylvania caused about 120 local household-supply wells to go dry within 3 months after the earthquake. The 2002 M7.9 Denali Fault earthquake in Alaska caused a 2-foot water-level rise in a well in Wisconsin, more than a thousand miles from the epicenter.

The other type of ground-water response is a water-level oscillation, which occurs more often, but is less commonly recorded. In the few cases where oscillations have been recorded, they resemble long-period seismograms, known as hydroseismograms. A well in Grants Pass, Oregon, is instrumented to record water levels at 1-second intervals, and the record from the Denali Fault earthquake shows peak-to-peak seismic oscillations of more than 4 feet and a permanent offset of 0.4 feet.

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