

Water Monitoring Near Shale Gas Sites (“fracking”)

Private well water quality is not regulated by the US EPA. In most states, well owners are responsible for monitoring their water quality. This is particularly challenging in areas where fracking activities are present. Gas well drilling activity, if properly conducted, does not necessarily contaminate groundwater. But poorly managed drill sites, leaky wastewater pits and accidental spills certainly impact the quality of surface water and of groundwater, which are the sources of private well water.

EHP has developed a water quality ranking system and monitoring strategy to encourage well owners to stay alert to the quality of their water and to take action when it is threatened by contamination. For more information, visit our website for the [full version](#) of this report.

If your private water well is within 3 miles of an unconventional gas and oil development (“fracking”) site, EHP recommends additional testing and monitoring:

Getting baseline tests done as soon as possible is important for an effective monitoring strategy. The more you can include in your baseline tests, the better. Thorough baseline tests include ALL of the following:

1. PA DEP suggests you test the following each year, regardless of your environment:

- coliform bacteria
- nitrates
- total dissolved solids (TDS)
- pH

2. We recommend you also test the following as part of your baseline test:

- ethane/methane, GRO (gas range organics), DRO (diesel range organics)
- conductivity
- chloride

3. Targeted water tests – for baseline and every 6 months during natural gas extraction activities. Although these tests are expensive, we encourage you to test for as many as you can, especially as a baseline:

- VOCs GRO DRO, surfactants, oil and grease
- strontium, sodium, ethane/methane
- barium, glycols, fluorides
- arsenic, calcium, iron
- potassium

Monitor your water for pH and conductivity in between targeted tests. This strategy can alert you to changes in water quality, but it may not be effective for all possible contaminants. This is why we recommend retesting every six months.

If you cannot afford many of these tests, monitoring for conductivity and pH, which are very inexpensive, will give you at least some information about your water quality. We think it is well worth the small amount of effort it takes to conduct these weekly tests.

These recommendations are our best advice based on the limited research that is available - the most essential and most cost effective. None of these strategies for monitoring your well water are 100% effective.

Water Monitoring Equipment and Instructions

To monitor conductivity and pH, use a conductivity-pH meter. This will involve weekly readings with the meter to determine what the conductivity and pH of your groundwater is normally. Fluctuations from this normal level may indicate contamination, and further testing can be done.

The normal range for these parameters are:

pH: 6.5-8.5

conductivity: <775 $\mu\text{s}/\text{cm}$

Testing well water for the presence of metals and inorganics is another important way to monitor contamination in your groundwater (examples of inorganic materials include nitrates and bromine). Testing for metals is much more difficult on an in-home scale, and the range of metals that can be tested is often limited. This is why EHP recommends that laboratory testing be done every 6 months. However, there are in-home test kits available too that can give measurements for a few metals, such as iron, lead, and copper. Levels of these metals can give an indication of water quality, but they are not a substitute for comprehensive testing.

Test water prior to your in-home water treatment or filtration system, and run the water for 5-10 min before taking the sample. This will ensure that you are testing your untreated water straight from the source. If you prefer, you can perform the test before and after the treatment system for comparison.



Sample conductivity meter:

Name: Water Quality Test Meter Pancellent TDS PH EC Temperature 4 in 1 Set

Tests for: Total dissolved solids (TDS), electrical conductivity, temperature, and pH meter

Price: \$21



Sample metal and inorganic test kits:

Name: Water Test Strip Kit - 14 in 1, 14-Way for Drinking Water Quality, Way Water, Hard Water and Total Hardness, Water Softener Systems, Spas, Hot Tubs, Fish Tanks and Aquariums. Easy Professional Results

Tests for: 14 factors- including iron, copper, lead, nitrate, bromine, pH, alkalinity, and chlorine

Price: \$19.95

Total cost- \$40-\$50