



## Standard Water Analysis Package

The U.S. Environmental Protection Agency (EPA) highly recommends periodic testing of your drinking water if you get water from a private water supply, such as water wells, springs, ponds, rainwater or other water sources. The City of Kerrville Laboratory is providing a Standard Water Analysis Package to provide our clients with general information on the water quality of their sample(s). Listed below are the testing parameters:

1. **Alkalinity and Hardness** --- Alkalinity and Hardness are affected by the type of minerals in the soil and watershed bedrock, and by how much the water comes into contact with these minerals.
  - **Alkalinity** is a measure of the capacity of water to neutralize acid without an increase in pH. The ideal range for alkalinity is 100-200mg/L. The lower the alkalinity, the more likely water is to be corrosive. High alkalinity may cause scaling.
  - **Hardness** is caused by the presence of calcium carbonate ( $\text{CaCO}_3$ ) and magnesium carbonate. Levels of hardness (as  $\text{CaCO}_3$ ): soft (0-60 mg/L), moderately hard (61-120 mg/L), hard (121-180 mg/L), very hard (>180 mg/L).
2. **Total Dissolved Solids (TDS)** --- TDS is a measurement of dissolved minerals from various rock formations and is a good general indicator of water quality. TDS is a Secondary Drinking Water Standard. The Texas Commission on Environmental Quality (TCEQ) has set the Maximum Contaminant Level (**MCL**) for public water systems at 1000 mg/L TDS.
3. **Conductivity** --- Conductivity is the capacity of water to carry an electrical current and varies both with the number and type of ions the solution contains. A normal conductivity value (measured in  $\mu\text{S}/\text{cm}$ ) is roughly twice the hardness (in mg/L  $\text{CaCO}_3$ ) in unsoftened water. Changes in conductivity over time may indicate changing water quality.
4. **Chloride** --- Chloride is one of the major inorganic anions in water and is dissolved from rock salt found in sedimentary rocks and soils. Chloride is also present in domestic and industrial wastewater. Chloride values of 300 mg/L or greater in drinking water can be very corrosive to pipes. Chloride is a Secondary Drinking Water Standard, and TCEQ has set the MCL for public water systems at 300 mg/L.
5. **Nitrate** --- Nitrate comes into water supplies through the nitrogen cycle rather than through dissolved minerals. It is one of the major ions in natural waters. However, high levels of Nitrate (>10mg/L) may indicate contamination of the water from sewage, fertilizer, or other similar materials. High levels of Nitrate may cause blood disorders, and are of special concern to infants and the elderly. Nitrate is a Primary Drinking Water Standard, and TCEQ has set the MCL for public water systems at 10 mg/L.
6. **Sulfate** --- Sulfate occurs in almost all natural water, and is one of the major dissolved constituents in rain. Bacteria, which attack and reduce Sulfate can cause hydrogen sulfate

gas ( $H_2S$ ) to form. High concentrations of Sulfate can cause bitter taste, and a bad smell. Sulfate is a Secondary Drinking Water Standard, and TCEQ has set the MCL for public water systems at 300 mg/L.

7. **Iron** --- Dissolved from rocks or soil, or from iron pipes and pumps. Iron may give water a reddish-brown color, bad taste and smell. It causes rust colored stains on sinks and fixtures, and may stain laundry. Iron is a Secondary Drinking Water Standard, and TCEQ has set the MCL for public water systems at 0.3 mg/L.
8. **Total Coliforms / E. coli**. --- Based on EPA's National Primary Drinking Water Regulations (NPDWR), the Public Health Goal for the presence of *Total coliform bacteria* and *E. coli* in drinking water is **ZERO** for it to be considered "safe to drink". All public water systems must monitor for microbial contaminants, and produce & distribute water that meets EPA and TCEQ requirements. However, EPA and TCEQ do not regulate private drinking water wells. It is the responsibility of the homeowner to maintain the safety of their water.
  - **Total Coliforms** are a group of closely related, mostly harmless bacteria that live in soil and water, as well as the gut of animals. The extent to which total coliforms are present in the source water can indicate the general quality of that water and the likelihood that the water is fecally contaminated. Total coliforms are currently controlled in drinking water regulations (i.e., Total Coliform Rule) because their presence indicates problems in water treatment or in the distribution system. EPA and TCEQ require all public water systems to monitor for total coliforms in distribution systems. If total coliforms are found, then the public water system must further analyze that total coliform-positive sample to determine if specific types of coliforms (i.e., fecal coliforms or *E. coli*) are present.
  - **E. coli** and Fecal coliform are bacteria whose presence indicates that water may be contaminated by human or animal wastes. Microbes in these wastes can cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with compromised immune system  
(→<http://water.epa.gov/drink/contaminants/basicinformation/pathogens.cfm> and <https://www.epa.gov/privatewells/human-health-and-contaminated-water> ) for more information)

Detailed information on drinking water samples may be found at the **Environmental Protection Agency's (EPA)** website at <http://water.epa.gov/drink/contaminants/index.cfm> , and at the website of **Centers for Disease Control and Prevention (CDC)** at <https://www.cdc.gov/healthyhomes/bytopic/water.html> .

**The Texas Commission on Environmental Quality (TCEQ)** sets surface water quality standards to maintain the quality of water in the state consistent with public health and enjoyment, protection of aquatic life, operation of existing industries and economic development of the state, as well as to encourage and promote development and use of regional and area wide wastewater collection, treatment, and disposal systems. More information can be found at <https://www.tceq.texas.gov/publications/rg/rg-346.html> .

If you have any questions regarding the tests above, please call the  
City of Kerrville Laboratory at 830-257-4230.