

## FACT SHEET: INTERPRETATION OF WATER SAMPLE RESULTS

"Pure" water is never found naturally. Many living organisms, such as bacteria, viruses, algae, and protozoa, can survive for long periods of time in water. Chemicals, both organic and inorganic, can also be found in water. Some chemicals, such as minerals (iron and hardness) are naturally occurring. Other chemicals, such as heavy metals or volatile organic chemicals result in pollution from human activities.

Not all biological or chemical parameters are a public health concern. Only a few of them can cause disease. Others are significant because they have aesthetic or economic implications and affect how the water can be used.

There are thousands of microorganisms and chemicals which can be detected in water. Unfortunately, checking for every possible item would require hundreds of tests. Therefore, it is important to identify the most common, or the most likely, tests that will identify the items contained in your water.

To check sanitary quality of drinking water, the most common tests are for **total coliform bacteria** and **nitrate-nitrogen**. These tests are described in this fact sheet.

### Limitations of Water Tests

Laboratory examinations of water drawn from domestic water supply systems can furnish information which is useful in determining the sanitary quality of the water. However, laboratory tests have important limitations which must be recognized. **if** the sample was properly collected and shipped, and **if** the laboratory examination was properly performed, the test results should describe the quality of the water **at the time it was collected**.

Unfortunately, contamination of a water supply may be intermittent, and a sample drawn on one particular day may not be representative of water collected on a different day. For this reason, it is necessary to consider the location and construction of a well and pumping system, as well as laboratory test results, in an evaluation of the safety of a water supply. If the laboratory examination of water drawn from a **properly located and constructed** supply shows the water to be of good sanitary quality, the supply should be satisfactory as a potable supply. However, an improperly constructed or located well cannot be considered safe, regardless of laboratory results.

If you have other concerns with the drinking water quality of your well water, contact the Washington County Public Health and Environment Department at 651-430-6655.

### Total Coliform Bacteria

Coliform bacteria are found naturally in the intestines of warm-blooded animals (including humans), soil, and lake and river water. The presence of these bacteria in a water sample indicates that some contamination has occurred, and other disease-producing organisms could be present. Diseases such as hepatitis, bacillary dysentery, and typhoid can be transmitted by contaminated water.

Coliform bacteria are not normally present in groundwater. They are usually introduced into a well during the well drilling process or during subsequent well repairs. Wells and plumbing systems should be disinfected with a chlorine solution when a new well is drilled, or when an existing well is repaired. Coliform bacteria may also enter a well if it has structural defects which allow surface water or sewage to enter.

The recommended limit for total coliform bacteria is less than one per 100 milliliters. In other words, ***coliform bacteria should not be detected*** in any amount.

When a water test indicates the presence of coliform bacteria, it is recommended that the well be disinfected and then resampled one week later. Information about disinfecting your well is available from the Washington County Public Health and Environment Department. If a second disinfection of the water supply system does not eliminate the coliform bacteria, the water supply should be inspected for defects by a licensed well contractor.

### **Nitrate-Nitrogen (NO<sub>3</sub>)**

Nitrate is a compound of nitrogen and oxygen formed during the decay of organic matter, such as sewage, animal wastes, and fertilizers. Low levels of nitrate in shallow, unprotected aquifers are naturally occurring. Most groundwater in Washington County contains less than one milligram per liter (mg/L) of nitrate-nitrogen.

However, higher levels of nitrate indicate poor sanitary quality of water. Nitrate contamination of groundwater can occur from a variety of sources. In urban or suburban areas, nitrate can result from excessive lawn fertilization or a concentration of individual sewage treatment systems in a small area. In rural areas, excessive crop fertilization, animal feedlots, municipal or industrial landfills, or a malfunctioning septic system can cause high levels of nitrate.

The maximum recommended limit set by state and federal authorities for nitrate-nitrogen is 10 mg/L. This limit is established to prevent the occurrence of the potentially fatal disease methemoglobinemia in infants, also known as the blue baby syndrome. Methemoglobinemia is caused when nitrates are reduced to a different form of nitrogen (nitrite) in the digestive system. The nitrite then enters the blood and combines with the hemoglobin to prevent the hemoglobin from carrying oxygen to the body. Nitrate is not harmful to children or adults, but is harmful to infants under the age of 6 months when nitrate-nitrogen levels exceed 10 mg/L. ***Water containing over 10 mg/L nitrate-nitrogen should not be used in preparing formula for infants.*** Water containing nitrate should NOT be boiled to reduce the levels. Boiling increases the nitrate level due to evaporation of the water.