



# COOPERATIVE EXTENSION

*Bringing the University to You*

---



John Cobourn  
Water Resources Specialist  
Steven R. Lewis  
Extension Educator, Douglas County

Revised by:  
Susan Donaldson, Ph.D.  
Water Quality Education Specialist  
University of Nevada Cooperative Extension  
(775) 784-4848

Fact Sheet 99-24 (formerly 92-30)

## Private Well Water Quality is Your Responsibility

Water from private wells is not monitored for quality by government agencies. This means you are responsible for the safety of the drinking water you and your family use. Water testing ensures that the supplies are safe.

Results of your neighbor's water analysis cannot be used to describe your well's water quality. Each well should be evaluated separately because wells side by side may draw water from separate aquifers. To be safe and have peace of mind, test your well water and do it soon.

### How Often Should You Test Well Water?

Test well water quality at least once each year for total coliform bacteria, and at least every three years for nitrate, pH and total dissolved solids (TDS). These characteristics are discussed below in more detail. Test more frequently if these constituents are close to the minimum standards. Testing for other contaminants is recommended if there is reason to believe they may be present in the ground water.

## There is More to Water Than H<sub>2</sub>O

Water is the universal solvent. It picks up and dissolves almost anything in its path. Pure water does not exist in nature. The well water we drink is impure. Minerals and other ingredients give water its flavor. Be sure that the contaminants in your water do not exceed "maximum contaminant levels" as approved by the Nevada State Health Division.

### Routine Domestic Water Analysis

The Nevada State Health Laboratory and private labs certified by Nevada health officials conduct routine domestic water chemistry analyses for domestic wells. This test is often required by lending firms on sale of the property to prove the well water is safe for human consumption. The routine domestic water analysis tests the level of arsenic, barium, fluoride, nitrate, and turbidity, as well as many other elements. These contaminants have maximum contaminant levels approved by the Nevada State Health Division that are considered primary health standards. TDS and pH are two important secondary standard contaminants evaluated by this test. Nitrate, pH, and TDS are used as comprehensive indicators of water quality for the following reasons:

## Nitrate

Septic systems, livestock facilities, stored fertilizers or other nitrogen sources can cause nitrate contamination. High nitrate levels pose a particular health risk to infants, pregnant women and the elderly. Well water testing should be done at early pregnancy and several times before the infant is six months old. Blue baby syndrome is an infant complication caused by high nitrates that prohibits blood from carrying oxygen. The nitrate concentration of drinking water must be below 10 ppm (parts per million) reported as N.

## pH

pH is an indicator of acidity and alkalinity. A neutral pH is 7. Water that is below pH 6.5 is considered acidic and has corrosive properties that may eventually lead to plumbing corrosion. Water above pH 8.5 has an alkaline taste and may develop "incrustative" plumbing problems, building up deposits in water heaters and fixtures.

## TDS (Total Dissolved Solids)

TDS is a measure of inorganic and organic substances dissolved in water. It is used to indicate an increase in one or more contaminants. Natural or human-caused activity such as mining or drilling may disturb the water-bearing formation and cause more materials to dissolve in water. Heavily salted roads, improperly lined landfills, junk yards, industrial activities, or chemical spills also may lead to increased TDS concentrations. TDS values above 1,000 ppm indicate problems. Further testing usually is required to pinpoint the exact problem. High TDS may result in offensive odors, tastes, colors and health problems.

## Sampling Your Well Water for Routine Domestic Analysis

The proper collection, handling and preservation of a water sample is crucial for an accurate water test. This procedure, as well as information on how to interpret results, is described in Cooperative Extension's fact sheet number 99-23, "How to Test Your Well Water and Understand the Results."

## What to Do With the Routine Domestic Water Sample

Water may be analyzed by the Nevada Health Laboratory, or by private labs listed in the telephone directory. If you choose a private lab, it is recommended that only those certified by Nevada health officials be used. Cost of the routine analysis will vary, so ask for rates in advance.

Analysis by the Nevada Health Lab requires completion of a form available from county public works departments or Bureau of Health Protection Services offices located throughout Nevada (see addresses provided at the end of this brochure). Water samples may be delivered or mailed directly to the State Lab. There are often time limits that must be followed to ensure accurate results.

## Testing for Total Coliform Bacteria

Testing for total coliform bacteria should be done annually. This test indicates contamination of drinking water by fecal material from humans and warm blooded animals. It may also identify presence of soil and plant material contamination. Bacteria in water can be a serious health problem. If the test confirms any coliform bacteria at all, it indicates the supply is unsanitary and may contain disease-causing organisms. Take action to decontaminate and re-test your well before drinking coliform-positive water.

## When Should the Total Coliform Bacteria Test Be Done?

Annually, or:

If there is any noticeable change in water color, odor or taste. Be aware that water contaminated with bacteria may smell, look, and taste normal.

- If flooding occurs near a well.
- If any person becomes sick from a suspected water-borne disease.
- If there has been any maintenance of the water supply system.

Whenever the water or system has been contaminated or is suspected to have been contaminated by human or animal waste.

## **Sampling Procedures for Total Coliform Bacteria**

Contact the Nevada State Health Laboratory or any regional office of the Bureau of Health Protection Services and request a sample vial and sampling procedure instructions for this test. The sampling procedure is slightly different from the routine domestic analysis. Samples should be sent to the lab Monday through Wednesday to ensure their arrival before the end of the week. Samples will not be analyzed if they are more than 30 hours old.

### **What Else to Test For**

There may be other contaminants in your water that are not discovered in the routine domestic or total coliform bacteria tests. An educated guess of the possible contaminant(s) will help narrow the field of tests. A good understanding of past and present land use practices may lead you in the right direction. Find out what pesticides local agricultural operations are using or have used. You may want to test your well water for traces of these chemicals. If your property is located near an industrial area or underground storage tanks, it would be logical to suspect solvents or fuels in the groundwater. In this case you may want to test the water for hydrocarbons. Knowledge of the local geology and naturally occurring materials can guide your decision about testing for other contaminants. For instance, radon has been discovered in groundwater in different areas.

If you suspect your house has lead in the plumbing, or lead in the solder used in fixtures, you may wish to have your water tested for lead. Lead can pose a severe health hazard to the young and old and should be considered when evaluating domestic water supplies. It is a good practice to run water to clear the pipes after 12-24 hours of no use. Consult local health officials regarding the presence of contaminants in your area.

### **What To Do About A Water Quality Problem**

The private domestic well owner has four choices to consider if a problem with water quality is discovered. Request Fact Sheet 99-25, "Protect Your Wellwater" for more information.

## **Better Protection of the Water Supply, called "Wellhead Protection"**

Well casings should be at least 12 inches above the ground surface and have a properly vented and sealed cap. Prevent contamination down and beside the well casing by proper use of a sanitary seal. Livestock should be kept away from the wellhead, and if a pump house exists, it should not be used for storage of potential contaminants.

### **Eliminate the Source of Contamination**

It is often difficult to identify the source of contamination to the water supply. Furthermore, once the source is eliminated, it takes time to cure the problem because groundwater moves so slowly. First consider any obvious human-caused disturbances, chemical storage, or dumping sites. Next contact professionals in local health departments and environmental agencies.

### **Change the Water Supply**

If the water quality problem is localized or associated with the condition of the well, it may be advisable to drill a new well. If the aquifer is contaminated, however, it would not be prudent to tap a new well into the same source. Bottled drinking water may be necessary for food preparation and drinking. Only in severe cases would it be necessary to use other water for bathing or cleaning.

### **Treat Water to Reduce Contamination Concentration**

Many methods of water treatment are available. When evaluating treatment options, determine if they are designed to treat your specific problem, check on efficiency in reducing the contaminant, and inquire about cost and maintenance requirements.

# NEVADA STATE HEALTH DIVISION BUREAU OF HEALTH PROTECTION SERVICES REGIONAL OFFICES

CARSON CITY (89710)  
505 East King St., Rom 103  
(775) 687-6615

ELKO (89801)  
850 Elm Street  
(775) 753-1138

ELY (89301)  
P O Box 949, City Hall  
(775) 289-3325

FALLON (89406)  
190 W. 1st St.  
(775) 423-5136

\*RENO (89503)  
UNR School of Medicine  
Nevada State Health Laboratory  
1660 N. Virginia St.  
(775) 688-1335

LAS VEGAS (89301)  
620 Belrose St.  
(702) 486-5068

TONOPAH (89049)  
Station House, P O Box 667  
(775) 482-3997

WINNEMUCCA (89445)  
25 W. 4th St.  
(775) 623-6409

\* Address for Nevada State Health Laboratory

## REFERENCES

The Safe Drinking Water Act. 1990. United States Environmental Protection Agency, Region 9, W-6-1, San Francisco, California.

Private Drinking Water Supplies-Quality, Testing, and Options for Problem Waters. 1991. Northeast Regional Agricultural Engineering Service. NRAES-47.

What Do the Standards Mean? A Citizen's Guide to Drinking Water Contaminants. 1990. Virginia Polytechnic Institute and State University, Blacksburg. 8-90-2M.

UNIVERSITY  
OF NEVADA  
RENO

The University of Nevada, Reno is an Equal Opportunity/Affirmative Action employer and does not discriminate on the basis of race, color, religion, sex, age, creed, national origin, veteran status, physical or mental disability, or sexual orientation, in any program or activity it operates. The University of Nevada employs only United States citizens and those aliens lawfully authorized to work in the United States.