



Well Sampling for Coliform & Nitrate

BACTERIA IN WATER

Bacteria and parasites that cause illness can enter a well in many ways. Whether the contamination comes from the materials and tools used in the well's construction, from septic failures near the well or from feedlot runoff, the bacteria and parasites must be destroyed to ensure safe water.

Every new, modified or reconstructed water well including pumps and all pumping equipment should be disinfected before being used and again each time it is opened for maintenance or repair. The well and pump contractor is responsible for disinfecting the well after construction and pump installation is completed. Water from a system that has been completely disinfected should be free of potentially harmful bacteria.

TESTING FOR COLIFORM

The Illinois Department of Public Health recommends that all new wells and those that have been repaired be tested to assure the water supply is safe. Bottles for testing water are available from local health departments. Where a local health department does not exist, contact the Department's nearest regional office (see list below).

Testing for coliform bacteria will reveal whether your water supply may be contaminated with infectious organisms, but it will not provide a direct measure of pathogenic, or disease-causing, bacteria. Specific disease-producing organisms present in the water are not easily identified, and testing for these organisms in the laboratory is complex and time-consuming. Coliform bacteria, on the other hand, can be easily identified in the laboratory and are used as an indicator of the bacteriological quality of water.

Some members of the coliform indicator group occur naturally in the intestines of humans as well as other warm-blooded animals and are discharged in great numbers in human and animal waste. Others occur naturally in surface water of varying quality and in topsoil. A positive analysis for coliform bacteria indicates that the well sample may have been contaminated by surface water or fecal material. This may suggest that the water well may not be properly constructed to protect it from sources of bacteriological contamination. Negative results indicate there was no contamination at the time of sampling.

NITRATES

A new water supply should be tested for nitrates. Levels above 10 milligrams per liter (mg/l) as nitrogen may cause illness in infants 6 months of age or younger. Nitrates found in ground water are usually produced by agricultural fertilizers, livestock wastes or septic systems.

SAMPLE COLLECTION

All bacteriological water sample bottles are sterilized prior to distribution. Handle them carefully to avoid introducing contaminants during the sampling process itself and be sure to follow closely the instructions included with the bottle.

Select a sampling point as close as possible to the water supply source. Do not collect from garden hoses, dirty faucets or swing-type faucets where foreign material may contaminate the sample. Remove faucet screens or aerators prior to sampling.

Before collecting the sample, open the tap and allow the water to run full flow until the pump starts and runs for several minutes. This allows the sample to be drawn directly from the ground water supply, rather than water that has been in storage for a period of time. Before collecting the sample, adjust the flow of water to a stream approximately the size of a pencil.

Remove the cap from the sterile bottle and take the sample immediately. Do not rinse the bottle or touch the rim of the bottle or the inside of the cap with your fingers or with the spout of the sampling point. Fill the bottle to the fill line, leaving an air space, and immediately replace the cap.

Complete the report form that was enclosed with the bottle. It is particularly important that the date of collection, sampling point, and return address be completed accurately. After completing the report form, place it in the box with the water sample bottle. Attach the mailing label and the required postage and mail the water sample as soon as possible. (Samples received more than 30 hours after being collected are too old for testing and will be disregarded.) Samples should reach the laboratory no later than Thursday of any week.

WATER SAMPLE RESULTS

Water sample testing results are sent to Department regional offices or local health departments for interpretation and mailing to homeowners.

If a sample is positive for coliform bacteria, the following procedures are recommended:

- The well should be resampled immediately to see if further testing shows the presence of coliforms. This will help to eliminate the possibility of contamination of the sample itself due to improper collection techniques, contaminated sample bottle or the incidental contamination of the pump or plumbing fittings.
- If the resample is not satisfactory, the Department regional office or local health department should be consulted. The well should be inspected to determine if it is properly constructed and located. Proper construction and location of a well reduces the possibility of contamination. Modification of the well may be necessary in order to assure a safe supply of water. Until a satisfactory analysis is obtained, the water should not be used for drinking or cooking unless brought to a rolling boil for at least five minutes. Please note that boiling will not eliminate a high nitrate concentration. In fact, boiling will increase the nitrate concentration.
- If the resample is negative for coliform bacteria and the nitrate concentration is less than 10 mg/l as nitrogen, the water supply may be considered safe for drinking based on those sample results. Annual testing of the well should be performed to assure the well is providing a safe supply of water.

ROCKFORD REGION

4302 N. Main St.
Rockford, IL 61103-1209
815-987-7511

MARION REGION

2309 W. Main St., Suite 106
Marion, IL 62959-1195
618-993-7010

PEORIA REGION

5415 N. University St.
Peoria, IL 61614-4784
309-693-5360

EDWARDSVILLE REGION

#22 Kettle River Drive
Glen Carbon, IL 62034
618-656-6680

CHAMPAIGN REGION

2125 S. First St.
Champaign, IL 61820-7944
217-278-5900

WEST CHICAGO REGION

245 W. Roosevelt Road, Building 5
West Chicago, IL 6018-4803
630-293-6800

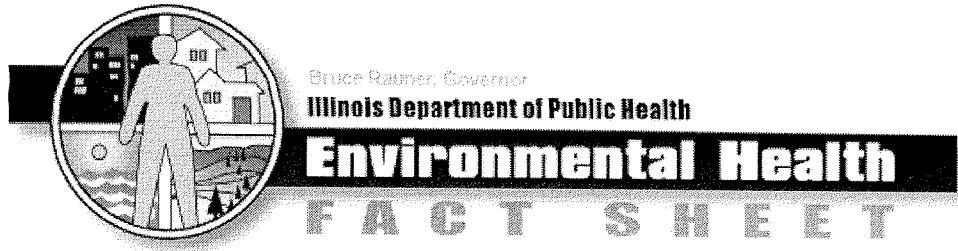
Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761, 217-782-5830, TTY (hearing impaired use only) 800-547-0466. Questions may be directed to your local health department, to one of the Illinois Department of Public Health's regional offices or to the Department's central office in Springfield.

Updated 5/10

Protecting health. improving lives.

© 2016 Illinois Department of Public Health.

[Privacy](#)



Nitrates In Drinking Water

Nitrates And Diet

Nitrate (NO_3) is a compound of nitrogen and oxygen found in nature and in many food items in our diet. Generally, the concentration of nitrates in the ground water is low. The main adult human intake of nitrates is from food rather than from water. Vegetables such as spinach, lettuce, beets and carrots contain significant amounts of nitrate. Drinking water normally contributes only a small percentage of our total nitrate intake.

Nitrates In Drinking Water

Although low levels of nitrates may occur naturally in water, sometimes higher levels, which are potentially dangerous to infants, are found. Illinois has adopted a drinking water standard for nitrate of 10 milligrams per liter (10 mg/L) as N (nitrogen). This standard is mandatory for public water supplies and is used as a guide for private water supplies. The U.S. Environmental Protection Agency also uses 10 mg/L as N as a mandatory national standard for public supplies under the Safe Drinking Water Act. The 10 mg/L standard expressed as nitrogen (N) is equivalent to 45 mg/L expressed as nitrate.

Sources Of High Nitrates

It is often difficult to pinpoint sources of nitrates because there are so many possibilities. Sources of nitrogen and nitrates may include runoff or seepage from fertilized agricultural lands, municipal and industrial waste water, refuse dumps, animal feedlots, septic tanks and private sewage disposal systems, urban drainage and decaying plant debris. Geologic formations and direction of ground water flow also may influence nitrate concentration.

Health Problems

High nitrate levels in drinking water pose a health risk to infants because they may cause methemoglobinemia, a condition known as "blue baby syndrome."

High nitrate levels interrupt the normal body processes of some infants. Nitrate becomes toxic when it is reduced to nitrite, a process that can occur in the stomach as well as in the saliva. Infants are especially susceptible because their stomach juices are less acidic and therefore are conducive to the growth of nitrate-reducing bacteria. (Adults can consume large quantities of nitrates in drinking water or food with no known ill effects; their stomachs produce strong acids that do not promote the growth of bacteria that convert nitrate to nitrite.) Nitrite in the blood combines with hemoglobin to form methemoglobin, which reduces the capability of the blood to carry oxygen to all parts of the body. This results in the "blue" condition of the baby's skin.

Infants younger than 6 months of age are most susceptible. However, because of individual differences in infants, some may not be affected. If an infant is affected, the skin turns a blue color, similar to the color of the blood vessels located close to the skin. If a parent or other caregiver observes this condition, medical help should be sought immediately. The infant is being asphyxiated because oxygen cannot be transported by the blood. Prompt medical attention normally results in quick recovery of the infant.

In all cases where drinking water contains more than 10 mg/L of nitrate as nitrogen, an alternative source of water should be found for the infant. Boiling the water will not reduce the nitrate concentration; in fact, it actually INCREASES the concentration by evaporating off the water and leaving the nitrates behind. Water that is high in nitrates should not be used for preparing infant formula or in any other way that could result in consumption by a baby.

Testing For Nitrate

Federal and state regulations require the testing of public water systems for nitrates; however, high nitrate concentrations can occur in private water wells. If infants will be consuming water from a private water well, the water should be tested for nitrates as well as for bacteria. To arrange for bacteriological and nitrate analyses of your drinking water or if you have questions concerning safe drinking water, contact your local health department or the nearest Illinois Department of Public Health regional office.

Regional Offices

ROCKFORD REGION

4302 N. Main St.
Rockford, IL 61103-1209
815-987-7511

MARION REGION

2309 W. Main St., Suite 106
Marion, IL 62959-1195
618-993-7010

PEORIA REGION

5415 N. University St.
Peoria, IL 61614-4784
309-693-5360

EDWARDSVILLE REGION

#22 Kettle River Drive
Glen Carbon, IL 62034
618-656-6680

CHAMPAIGN REGION

2125 S. First St.
Champaign, IL 61820-7944
217-278-5900

WEST CHICAGO REGION

245 W. Roosevelt Road, Building
5
West Chicago, IL 6018-4803
630-293-6800

Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761, 217-782-5830, TTY (hearing impaired use only) 800-547-0466. Questions may be directed to your local health department, to one of the Illinois Department of Public Health regional offices or to the Department's central office in Springfield.

[idph online home](#)
[environmental health home](#)



Illinois Department of Public Health
535 West Jefferson Street
Springfield, Illinois 62761
Phone 217-782-4977
Fax 217-782-3987
TTY 800-547-0466
[Questions or Comments](#)

Laboratories Certified for Nitrate/Nitrite Sampling

ARRO Laboratory, Inc.
P.O. Box 686
Joliet, IL 60434-0686

Telephone: 815-727-5436

Culligan Analytical Laboratory
One Culligan Parkway
Northbrook, IL 60062

Telephone: 847-205-5925

Environmental Monitoring and Technologies, Inc.
8100 North Austin Ave
Morton Grove, IL 60053-3203

Telephone: 874-967-6666

McHenry Analytical Water Laboratory, Inc.
4314-A, Crystal Lake Rd
McHenry, IL 60050

Telephone: 815-344-4044

PDC Laboratories, Inc.
2231 W. Altorfer Drive
Peoria, IL 61615

Telephone: 309-692-9688

Prairie Analytical Systems, Inc.
1265 Capital Airport Drive
Springfield, IL 62707-8413

Telephone: 217-753-1148

Suburban Laboratories, Inc.
1950 Batavia Ave, Suite 150
Geneva, IL 60134

Telephone: 708-544-3260

Test, Inc.
2323 4th Street
Peru, IL 61354

Telephone: 815-224-1650
