

**2022 LTL Water Quality Companion Research  
to  
Freshwater Solutions Enteric Bacteria Monitoring Research**

**Submitted by LTLA WQ Committee**

**November 2022**

## Introduction

LTLA utilized SOS Analytical Lab in 2021 and 2022 for testing the presence of total Coliform bacteria, *E. coli* bacteria and nitrate to allow comparison to Freshwater Solutions (FWS) analysis that measures human enteric bacteria using qPCR testing. FWS qPCR analysis detects very low levels of human enteric bacteria found in the human gut and feces. Detection of human enteric bacteria in a drinking water well means that there is a connection between a septic system and the drinking water well. This, in and of itself, is concerning and a cause to inspect your well and septic system. But another question arises if human enteric bacteria is discovered in well water: is the water dangerous to human health? The Benzie-Leelanau Health Department answers this question by analyzing well water for total coliform, *E. coli*, and nitrate. So, we analyzed well samples for the same parameters using the same analytical protocol as our health department to find out if water that contains human enteric bacteria is still safe to drink.

LTLA volunteers collected water samples from both well and surface water for the FWS study and this companion study at the same time, date, manner, and locations.

### **What do these results tell us?**

Well Water Total Coliform and *E. coli*: Coliform bacteria can be from: stormwater runoff from woodlands or pastures; wild or domestic animal waste; and/or poorly maintained or overloaded septic systems. When coliform bacteria are washed into the ground by rain, melting snow, or irrigation, it can get into drinking water

through damaged well-casings or ponding of water around the well head or drain field.

Total coliforms are a group of related bacteria that are (with few exceptions, including *E. coli*) not harmful to humans. A variety of bacteria, parasites, and viruses, known as pathogens, can potentially cause health problems if humans ingest them. USEPA considers total coliforms a useful indicator of other pathogens for drinking water (excerpted from *USEPA Drinking Water Requirements for States and Public Water Systems, Total Coliform Rule*).

*E. coli*, however, is a type of coliform bacteria that is a direct measure of human or animal fecal contamination and can cause human illness like upset stomach, vomiting, fever, or diarrhea. Further qPCR analysis can identify if the source of *E. Coli* contamination is human.

If your well water samples are positive for total coliform or *E. coli*, the Benzie-Leelanau Health department can offer recommendations to identify and fix the problem. See the attached information sheet for more details about possible sources of contamination and ways to prevent harmful bacteria from entering your well.

Nitrate: None of the well water samples contained nitrate above the USEPA maximum contaminant level, 10 mg/L. See the attached information sheet to learn more about nitrate. Surface water nitrate levels were all below laboratory detection levels.

Surface Water *E. coli* : Water is safe to swim in if *E. coli* concentrations are less than 300 *E. coli* per 100 mL of lake water. Beaches are closed to swimming if the mean of three *E. coli* concentrations exceed this amount (please note that we only collected one surface water sample, not three). Here's what the Michigan Public Health Code Water Quality Standards says: "At no time shall the water of the state protected for total body contact recreation contain more than a maximum of 300 *E. coli* per 100 ml." There are a variety of sources that contribute bacteria and other pathogens to the surface water. These sources include septic systems, storm (rain) runoff, wild and/or domestic animal waste, and agriculture runoff. Humans, dogs, geese, seagulls and cows, all can contribute to high *E. coli* concentrations. For more information follow this link: <https://www.michigan.gov/egle/about/organization/water-resources/beaches/about-beach-monitoring>

## **Observations**

Please see the Appendix for analytical results.

### Water Wells

As in 2021 there were no positive *E. coli* 2022 results from well water at any site. This is good news and correlates with Freshwater Solutions qPCR analysis that detected no human enteric bacteria in well water. Three drinking water wells analyzed positive for total coliform and are of some concern. None of the well water samples contained nitrate above the USEPA maximum contaminant level, 10 mg/L.

## Surface Water

Surface water tests for *E. coli* were generally less than 300 colonies/ mL, indicating safe swimming conditions.

One surface water sample collected on Aug 3 at site #1 contained very high concentrations of *E. coli*. We believe that this spike is related to ducks. It was observed that starting in mid-July a group of ducks took up residence on the resident's dock. In addition, there was rain the evening before the Aug 3 water collection that might have washed duck waste into the lake, causing the abnormally high *E. coli* reading.

Notice that rain on Aug 2 probably had an impact on the higher levels of *E. coli* present in all of the surface water samples on Aug 3 as stormwater washed into the lake. This highlights the importance of maintaining a buffer of plants along your lakeshore to block and absorb stormwater runoff from entering the lake.

August is also "high season" at Little Traverse Lake. More people on the lake, mean more heavily used septic systems. The good news is that we saw no evidence of septage entering the lake when these same samples were analyzed for human enteric bacteria by Freshwater Solutions. Please see Enteric Bacteria Monitoring Research Year 3 Data Study Report published November 2022 by Freshwater Solutions for more details.

Surface water nitrate levels were all below laboratory detection level

## Appendix

### 2022 LTL Water Quality Companion Research Analytical Results

Site #	June 6/22/22				July 7/14/22				August 8/3/22			
	<u>Well Water</u>		<u>Surface Water</u>		<u>Well Water</u>		<u>Surface Water</u>		<u>Well Water</u>		<u>Surface Water</u>	
	Coliform /E.coli	Nitrate [mg/L]	E. coli*	Nitrate [mg/L]	Coliform /E.coli	Nitrate [mg/L]	E. coli*	Nitrate [mg/L]	Coliform /E.coli	Nitrate [mg/L]	E. coli*	Nitrate [mg/L]
1	A/A	2.09	37	0.15	A/A	1.68	1	ND	A/A	1.83	>2419	0.11
23	A/A	ND	2	0.12	A/A	ND	0	ND	A/A	ND	248	ND
24	P/A	ND	57	0.15	P/A	ND	6	ND	A/A	ND	435	ND
25	A/A	0.17	5	0.14	A/A	0.23	2	ND	P/A	0.40	77	ND
26	P/A	ND	5	0.14	P/A	ND	0	ND	P/A	ND	49	ND
27	A/A	ND	1	0.14	A/A	ND	0	ND	A/A	ND	0	ND
28	A/A	ND	10	0.15	A/A	ND	0	ND	A/A	ND	102	ND
29	A/A	ND	1	0.13	A/A	ND	1	ND	A/A	ND	7	ND
9					A/A	ND	2	ND				

A/A : Coliform bacteria and *E. coli* were not found.

P/A : Coliform bacteria was found and *E. coli* was not found.

ND : Not Detected. The lab did not detect, or find, nitrate at or above the amount they can reliably report (0.10 mg/L).

\**E. coli* found in surface water are reported as the number of colony-forming units present in 100 mL of water.

# UNDERSTANDING YOUR WATER TEST RESULTS

## Coliform Bacteria Analysis

*NOTE: This test is time sensitive! If the sample does not arrive at the lab within 30 hours of being taken, results will not be valid. Preferably, samples should only be taken and mailed Monday – Wednesday to avoid the possibility of weekend postal delays.*

<b><i>If the lab report states:</i></b>	<b><i>This means:</i></b>
<b>Not detected</b>	No coliform bacteria were detected in the water sample. The sample met the state drinking water standard at the time of sampling.
<b>Positive for Total Coliforms</b>	Coliform bacteria were detected in the water sample, and the water may not be safe for drinking. Have your water supply retested to confirm these results. Contact the Health Department for further instructions.
<b>Positive for <i>E. Coli</i></b>	<i>E. coli</i> were detected in the drinking water sample, and the water may not be safe for drinking. Have your water supply retested to confirm these results. Contact the Health Department for further instructions.

## Partial Chemical Analysis

### Test Results in mg/L (ppm)

*Note: ND = Not Detected – If substance is present, it is at a low enough level that it cannot be detected by the testing method used.*

<b>Test</b>	<b>Excellent</b>	<b>Satisfactory</b>	<b>Unacceptable</b>	<b>Potential Problems</b>
<b>Nitrate</b> (as N)	0	1 – 10	Over 10	Nitrate poisoning, especially in infants
<b>Nitrite</b> (as N)	0	0 – 1	Over 1	Nitrite poisoning, especially in infants
<b>Chloride</b>	0 – 20	20 – 250	Over 250	Taste, corrosion
<b>Fluoride</b>	0.7 – 1.2	0 – 0.7 1.2 – 4.0	Over 4.0	Low levels beneficial in reducing tooth decay. High levels may cause bone disease or discoloration of teeth.
<b>Hardness</b>	50 – 125	125 – 250 25 – 50	Over 250 or less than 25	Scaling of water fixtures, laundry problems, water spotting, discolorations at high levels. Corrosion at low levels. (17.1 mg/L = 1 grain)
<b>Iron</b>	0 – 0.2	0.2 – 0.3	Over 0.3	Staining, cloudy water, taste, color, odor
<b>Sulfate</b>	0 – 50	50 – 250	Over 250	Laxative, taste, odor, buildup of scale on boilers and heat exchangers
<b>Sodium</b>	0 – 20	20 – 250	Over 250	Taste, special diets may require water with low sodium content

# Protect Against the Unknown: Test Your Drinking Water from Your Well

Contaminants in drinking water can harm everyone's health. Some can cause short-term health problems while others can cause long-term health problems.

**As a well owner, you can protect your family's health by testing your water regularly.**

## Why is it important to test your drinking water?

Testing will keep you informed about your water quality and help identify problems. Testing the water used for drinking, cooking food, or mixing powdered infant formula is especially important.

Pregnant women, infants, and young children's health can be more at risk. It's important to talk with your doctor if you have health concerns.

- Some contaminants can pass from the mother to the fetus. This puts the fetus at risk of harm to their health and development.
- Babies drink more for their size than children and adults. This can result in higher exposure to babies than adults, which could increase risk of harm to their health.



## When should you test your drinking water, and for what?

Wells are required to be tested for coliform bacteria when installed or repaired in Michigan. Based on where you live, you may be required to test your water at other times, such as during real estate transactions.

Call your local health department to learn more about when you need to test your water. They may also recommend additional testing based on water conditions in your area.

<b>The Michigan Department of Health and Human Services (MDHHS) recommends the following routine well testing schedule.</b>	Every Year	Every 3 to 5 Years
	Coliform Bacteria and <i>E. coli</i>	Arsenic
	Nitrate	Copper
	Nitrite	Lead

Other times to consider testing your water:

- A household member becomes pregnant
- An infant or young child is living in the home
- Flooding has happened near the well
- Repairs were made to the well
- The water's taste, color, or smell changes



## Why test for these contaminants?

<b>Coliform Bacteria and <i>E. coli</i></b>	Most coliform bacteria are not harmful, but some can make you sick. Symptoms may include an upset stomach, vomiting, fever, or diarrhea. Children and the elderly are more at risk. <i>E. coli</i> bacteria in drinking water can make you sick or even cause death.
<b>Nitrate and Nitrite</b>	Swallowing water with high amounts of nitrate can cause a condition called methemoglobinemia, also known as “blue baby syndrome.” This causes the skin around the eyes and mouth to turn a bluish color and can cause death if not addressed. The body can change nitrate into nitrite, limiting the ability of blood to carry oxygen. Infants younger than six months of age and pregnant women are more at risk of developing this condition.
<b>Arsenic</b>	Arsenic is known to cause cancer so any amount may be harmful. Drinking water with arsenic over time can increase the chances of developing cancer. Arsenic in drinking water can also cause lesions on the skin, hard patches on palms of hands and soles of feet, and changes in skin color.
<b>Copper</b>	Copper is found in many foods and is important to human health. However, too much copper over a short time may cause stomach upset. Too much over a long time may cause liver or kidney damage. People with Wilson’s disease should be aware of the level of copper in their drinking water.
<b>Lead</b>	Any amount of lead may be harmful. Lead in a child’s body can slow growth and development, damage hearing and speech, and make paying attention harder. Lead can be passed from the mother to the fetus.

## Get testing!

Call your local health department or a certified drinking water laboratory and let them know what you are interested in testing your water for. They can help you get the sampling bottles needed and provide instructions. It is important to carefully follow instructions provided.

It may be cost effective to get a water test called “partial chemistry.” This test includes nitrate and nitrite, which are recommended to be tested for every year. It also includes testing for fluoride, chloride, hardness, sulfate, sodium, and iron. These contaminants may change the taste, color, or smell of the water.

## For More Information

### Michigan Department of Health and Human Services

Drinking Water Hotline  
844-934-1315

Michigan Local Health Departments  
[Malph.org/Resources/Directory](http://Malph.org/Resources/Directory)

### Michigan Department of Environment, Great Lakes, and Energy

Well Construction  
[Michigan.gov/WaterWellConstruction](http://Michigan.gov/WaterWellConstruction)

Laboratory Services  
[Michigan.gov/EGLElab](http://Michigan.gov/EGLElab)

517-335-8184



# Coliform Bacteria in Drinking Water for Well Owners

## What are coliform bacteria?

Coliform bacteria are found in soil, surface water, on plants, and in the intestines of warm-blooded animals and people. One type of coliform bacteria called *Escherichia coli* (*E. coli*) is a sign that fecal waste is in the water. Some types of *E. coli* in drinking water can make you sick.

## What health problems can coliform bacteria cause?

Most coliform bacteria are not harmful. However, some can make you sick. A person that has been exposed to these bacteria may have an upset stomach, vomiting, fever, or diarrhea. Children and the elderly are more at risk from these bacteria.

**Take *E. coli* bacteria seriously when found in drinking water. Some *E. coli* can make you sick or even cause death.**

Vomiting

Upset  
Stomach

Fever

Diarrhea

## How does coliform bacteria get into your well water?

When coliform bacteria are washed into the ground by rain, melting snow, or irrigation, it can get into drinking water. Coliform bacteria can be from:

- Woodlands, pastures, or feedlot runoff
- Wild or domestic animal waste
- Poorly maintained septic systems

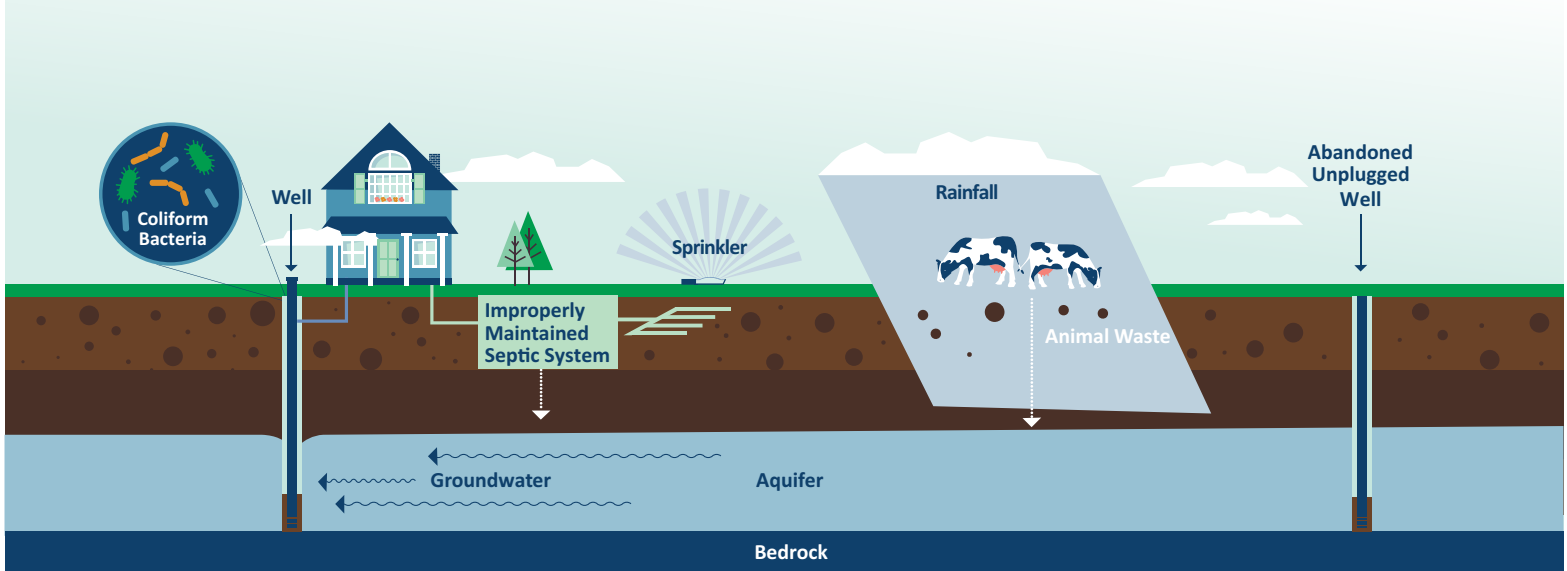
Coliform bacteria can enter your water if you have:

- A damaged wellhead (the part of the well that's above ground) including the casing and/or well caps
- An unplugged or abandoned well in the area
- A new well not properly disinfected
- Drinking water pipes connected to non-drinking water sources such as waste water, laundry sinks, or garden hoses



*Damaged wellhead with cracked well cap and exposed wires*

Photo provided by Barry-Eaton District Health Department



## How do you know if you should test your well for coliform bacteria?

The Michigan Department of Health and Human Services (MDHHS) recommends testing your water for coliform bacteria (test includes *E. coli*) every year. Bacteria can appear randomly and, sometimes, seasonally. Test your water if:

- Your water's taste, color, or odor changes suddenly
- The water turns cloudy after it rains or flooding happens near the wellhead
- People drinking the water experience an upset stomach, vomiting, fever, or diarrhea
- A source (septic system or barnyard) is within 50 feet of your well.

## Testing your water

- Call your local health department or a certified drinking water laboratory to get a test kit. To learn more about test kit availability, fees, and instructions, see the "For More Information" section below.
- Carefully follow the test kit instructions. Mishandling the test kit bottle can show bacteria when there is none in your water. For example, bacteria on your hands could get into the water bottle.
- Send your water sample to a certified drinking water laboratory.

Below are examples of laboratory water test results and a description of what the results mean.

Result Examples	Result Descriptions
Not detected/Negative/Absent/0	Coliform bacteria and <i>E. coli</i> were not found
Positive/Present/Any number from 1 to 200	Coliform bacteria was found and <i>E. coli</i> was not found
EC Positive/ <i>E. coli</i> detected/fecal coliform positive	Coliform bacteria and <i>E. coli</i> were found

## Recommendations

MDHHS recommends testing your water every year for coliform bacteria (test includes *E. coli*).

When coliform bacteria and *E. coli* are **not** found in the water, you can use your water for drinking, cooking, bathing and all other water-related activities.

When coliform bacteria, *E. coli*, or both are found in the water, talk to your local health department to identify and fix the problem.

- Until the problem is fixed, use another source of water such as bottled water for drinking, cooking, preparing baby formula or food, washing produce, brushing your teeth or any other use where you may swallow the water.
- If you are unable to use another source of water, you can bring your water to a full rolling boil (a boil that does not stop bubbling when stirred) for 1 minute to kill the coliform bacteria and *E. coli*. You can save and use the water for drinking and cooking once boiled.
- Your local health department may suggest getting your well disinfected. Work with a registered well driller to inspect the well before disinfection. Repairs to the well may be needed. Disinfecting may take several times to be free of coliform bacteria and *E. coli*.



## For More Information

Michigan Department of Health and Human Services

800-648-6942

ask for the Drinking Water Investigation Unit

List of Michigan Local Health Departments

[Malph.org/Resources/Directory](http://Malph.org/Resources/Directory)

Michigan Department of Environment, Great Lakes, and Energy

[Michigan.gov/DrinkingWater](http://Michigan.gov/DrinkingWater)

[Michigan.gov/WaterWellConstruction](http://Michigan.gov/WaterWellConstruction)

Laboratory Services

[Michigan.gov/EGLElab](http://Michigan.gov/EGLElab) and choose "Certifications"

# Nitrate and Nitrite in Drinking Water for Well Owners

## What are nitrate and nitrite?

Nitrate ( $\text{NO}_3$ ) and nitrite ( $\text{NO}_2$ ) are forms of nitrogen in the environment, both natural and human-made. Large amounts of nitrate in drinking water can be harmful to a person's health because nitrate can change into nitrite in the human body.

## What health problems can nitrate and nitrite cause?

Swallowing high amounts of nitrate and/or nitrite can cause a condition called methemoglobinemia (met-he-mo-glo-bi-ne-mia). This condition affects the blood's ability to carry oxygen. Infants younger than six months of age and pregnant women are more at risk of developing this condition. Others can develop this condition too, such as those with genetic conditions or reduced stomach acidity. It's important to talk with your doctor or your child's doctor if you have concerns about methemoglobinemia.



### Pregnant Women and Infants

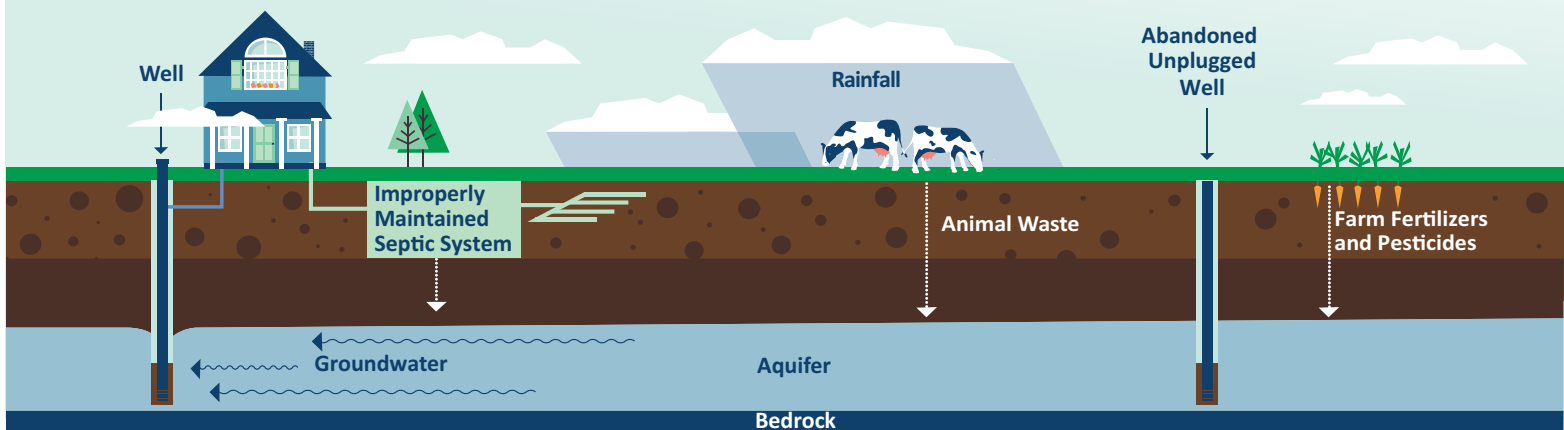
During pregnancy, the blood's ability to carry oxygen changes. When combined with high amounts of nitrate, a pregnant woman's chances of developing this condition increases.

Methemoglobinemia is commonly called blue baby syndrome in infants younger than six months of age. Infants can develop this condition when given water or formula made with water that has high amounts of nitrate. Infants have less acid in their stomach, resulting in more bacteria that change nitrate to nitrite. Having too much nitrite in the body affects the blood's ability to carry oxygen. This causes the skin around the eyes and mouth to turn a bluish color. Methemoglobinemia can cause death if not addressed. Immediately stop using the water and contact your child's doctor if you notice these symptoms.

## How does nitrate get into your well water?

When nitrate seeps into the ground it can get into drinking water. Nitrate is more likely to enter your water if you have a shallow well, damaged well casings and fittings, a well not within a clay barrier underground, or nearby unplugged or abandoned wells. Nitrate found in drinking water is often from:

- Fertilizers
- Livestock waste
- Failing septic tanks, drainfields and drywells



## How do you know if nitrate or nitrite is in your well water?

Testing for nitrate and nitrite is the only way to know if they are in your water. They have no taste, color or odor. The Michigan Department of Health and Human Services (MDHHS) recommends testing your water every year. Call your local health department or a certified drinking water laboratory to get a test kit. To learn more about testing kit availability, fees, and instructions, see the “For More Information” section below.

## What do your water test results mean?

The Maximum Contaminant Level, or MCL, for nitrate is 10 milligrams per liter (mg/L) and nitrite is 1.0 milligrams per liter (mg/L). If your test result is above the MCL for nitrate or nitrite, follow the recommendations below.

Laboratory reports may give the units of measurement as mg/L or parts per million (ppm). Mg/L is the same as ppm. Below is an example of laboratory test results and a description of what the test results mean.

Result Example	Result Description
Not detected (ND)	The lab did not detect, or find, nitrate/nitrite in your water sample at or above the amount they can reliably report.
Number	If the test result listed is a number, the lab found nitrate/nitrite in your water sample.

## Recommendations

MDHHS recommends testing your water every year for nitrate and nitrite.

If your results for nitrate, nitrite, or both are below the MCLs, you can use your water for drinking, cooking, bathing, and all other water-related activities.

If your test results for nitrate, nitrite, or both are above the MCLs, talk to your local health department to identify and fix the problem.

- Until the problem is fixed, use another source of water such as bottled water for drinking, cooking, and preparing infant formula. **You cannot remove nitrate or nitrite by boiling the water.** Boiling will increase the amount of nitrate or nitrite in the water that’s left.
- Install a reverse osmosis, ion exchange, or distillation filtration system. These systems require regular maintenance and testing to make sure they are working correctly. If the system is not installed, operated, or maintained correctly, it could let nitrate and/or nitrite pass through the filter.
- Drill a new well.



## For More Information

Michigan Department of Health and Human Services  
Drinking Water Hotline  
844-934-1315

List of Michigan Local Health Departments  
[Malph.org/Resources/Directory](http://Malph.org/Resources/Directory)

Michigan Department of Environment,  
Great Lakes, and Energy

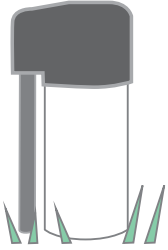
[Michigan.gov/DrinkingWater](http://Michigan.gov/DrinkingWater)  
[Michigan.gov/WaterWellConstruction](http://Michigan.gov/WaterWellConstruction)

Laboratory Services  
[michigan.gov/EGLElab](http://michigan.gov/EGLElab) and choose “Certifications”

# Drinking Water Well Maintenance

Maintaining your well and the surrounding area is important for protecting your drinking water and your health. Here are tips on how to maintain your well through regular inspections, testing, and treatment.

## Well Inspection



### Wellhead and Well Cap

Check the wellhead (the part of the well that's above ground) and the well cap (the part that covers the wellhead) several times a year. Look at the wellhead casing and cap for any cracks or openings that shouldn't be there. The cap keeps rainwater, insects, and small animals from getting into the well.

If you find problems, contact a registered well driller. To find a registered well driller in your area, visit [Michigan.gov/WaterWellConstruction](https://Michigan.gov/WaterWellConstruction) and choose "Directory of Registered Constructors."

## Well System

- Have a registered well driller inspect the well system every 10 years or as needed. The inspection will include the condition of the well, pump, storage tank, piping, and valves. When it's time for a new well, contact a registered well driller for installation and to properly abandon (plug or seal) the old well.

## Surroundings

Look around your well to see if items or materials are nearby that could impact your well.

- Do not store, use, or dump harmful materials such as paint, fertilizer, pesticides, and motor oil near the wellhead. If you do use lawn fertilizer, follow the application instructions. Don't over apply near the wellhead.
- Keep the top of your wellhead 12 inches above the ground. Slope the ground away to help keep water from ponding near the wellhead.
- Do not plant shrubs and trees near the well.
- Be sure you can easily get to your wellhead for maintenance and/or for pump replacement. Never build a deck or porch over a wellhead. Buildings should be at least 3 feet from the wellhead.
- Keep dog kennels or animal holding areas at least 50 feet from your well.
- If your home has a septic system it's important to maintain it. Poor maintenance can lead to contaminants getting into your drinking water.

## Routine Well Maintenance



Regular maintenance is recommended for your well, including water testing and inspection. Having a maintenance routine will keep you informed of your drinking water quality and possibly identify problems.

## Water Testing

Michigan homeowners are required to test their drinking water for coliform bacteria when a well is installed. Consider testing your drinking water if flooding has happened near your well, your well has had repairs, or you notice changes in your water's taste, color, or odor. The Michigan Department of Health and Human Services (MDHHS) recommends testing:

- Every year for coliform bacteria, *E. coli*, nitrate, and nitrite
- Every three to five years for arsenic, copper, and lead
- Check with your local health department to see if there are other times you need to test your drinking water. They may recommend other testing based on water conditions in the area.

## Well Performance

The rate at which a well pumps groundwater (called well yield) can decrease over time for many reasons. Work with a registered well driller to find and fix the problem. Possible reasons for a decrease in well yield could be:

- Buildup of mineral deposits in a well
- Buildup of microorganisms such as bacteria
- Sand is being pulled into the well by the well pump
- Well screen or casing corrosion
- Parts of the well system not working correctly (pressure switch and pump failure)

## Water Treatment

Water treatment could include disinfecting your well or installing a filtration system. Contact your local health department or MDHHS to discuss the best option before starting treatment.

- If water treatment is needed, be sure to test the water for the contaminant of concern before and after treatment. This will tell you if the treatment is working correctly.
- If disinfection is necessary, contact a registered well driller to properly disinfect the well.
- Select a water filtration system certified by NSF International ([NSF.org](https://www.nsf.org)) to reduce or remove the contaminants in your well.
- Follow the recommended inspection and maintenance routine for your treatment system.

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## Well Documentation



You will receive a copy of your water well record after the well has been installed by a registered well driller. This record contains important information, such as:

- Well location
- Well depth
- Pumping rate
- Pump and pressure tank information
- Drilling method
- Date of completion

## Can't find your well record? Check Wellogic

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has an online well record system called Wellogic. You may find your well record if the well was installed in the year 2000 or later. Visit [Secure1.State.Mi.Us/Wellogic/Login.aspx](https://Secure1.State.Mi.Us/Wellogic/Login.aspx).

If your well was installed before the year 2000, you can search scanned copies of well records at [Deq.State.Mi.Us/Well-Logs/](https://Deq.State.Mi.Us/Well-Logs/). If you cannot find your well record, or need help finding your record, contact your local health department. If there is no record of when your well was installed, consider getting an inspection.

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## For More Information

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[Michigan.gov/WaterWellConstruction](https://Michigan.gov/WaterWellConstruction)

Laboratory Services  
[Michigan.gov/EGLELab](https://Michigan.gov/EGLELab)