

# What is in your water?

Madison's water, though generally considered healthy, does contain numerous contaminants, ranging from minerals such as lead to industrial chemicals such as carbon tetrachloride.

What is in your water depends partly on which well serves your neighborhood. For the most part, the water that comes out of your faucets comes from the wells closest to your home. But pollutant levels in your home tap water can be different from your well.

Both iron and manganese, a mineral that can cause

health problems at high levels, have plagued Madison Water Utility customers in the past couple of years.

Pollutants can have health impacts if they occur at levels beyond the health standards set by the Environmental Protection Agency.

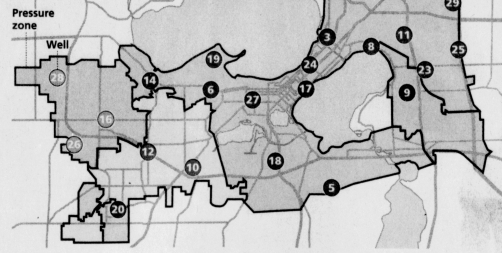
Among the chemicals showing up in a number of Madison wells are tetrachloroethylene and trichloroethylene, both of which can cause cancer and liver problems.

NOTE: Pollutant levels are measured in parts per billion.

## Pressure zones

Madison has 24 wells in various pressure zones – or areas of the city that share water and water pressure.

NOTE: The wells are not in consecutive order, because some wells are no longer in use (not shown).



## WHERE TO GET HELP

# Starting point is your local utility

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Communities throughout Wisconsin have struggled with drinking water problems.

An analysis of water quality test data by the Environmental Working Group, a nonprofit environmental organization, showed that, between 1998 and 2002, water utilities detected 118 contaminants in 1,089 communities across the state.

Of those 118 contaminants, 60 were in excess of federal health standards.

One Wisconsin city, Green Lake, was ranked as being the most community in the nation for levels of manganese, the mineral that has so plagued Madison in recent months.

In Green Lake, about 85 miles northeast of Madison, tests showed levels of manganese in drinking water at 16,300 parts per billion. The Environmental Protection Agency's health standard for manganese is 300 parts per billion.

If you are concerned about the water you drink, no matter where you live in Wisconsin, there are places you can turn for information.

The best place to start, if you get your water from a public water system, is your local utility.

Each utility is required by the EPA to file an annual report on the results of its water-testing program for the previous year. The report must show the minimum and maximum levels of contaminants measured in the utility's wells.

You can also access water quality reports for all the state's public water utilities online through the state Department of Natural Resources. Its Web site is [www.dnr.state.wi.us/org/water/dwg/](http://www.dnr.state.wi.us/org/water/dwg/).

If you are among the two-thirds of Wisconsin residents who get their water from one of 750,000 private wells, the DNR Web site also contains information about contaminants in private wells and how to arrange to test them.

The Madison Water Utility will pay for home tap water testing if it is part of investigating a problem.

The utility will also provide free testing for manganese upon request, if there is a baby 6 months or younger or a person with liver problems living in the home.

### Above standard

#### Under standard

- Present, HIGH 50-99% of standard
- Present, LOW 0-49% of standard

Well	Years old	Percent of days in use
3*	78	80%
5	80	100%
6	68	17%
7	67	30%
8	61	33%
9	55	100%
10	55	100%
11	48	100%
12	48	100%
13	46	100%
14	44	100%
15	39	100%
16	38	17%
17	38	28%
18	35	100%
19	32	62%
20	33	100%
23	48	65%
24	32	90%
25	23	100%
26	18	100%
27	14	27%
28	4	100%
29	1	100%

### Manganese

Advisory health standard – 300 ppb

- Potential health risks: neurological problems
- 50 ppb or more can cause water to become discolored
- Naturally occurring substance

Year	Worst year's
'00	236.0 ppb
'01	14.0
'02	2.2
'03	38.0
'04	48.0
'05	0.3
'06	53.0
'07	12.0
'08	12.0
'09	15.0
'10	0.7
'11	7.5
'12	1.2
'13	47.0
'14	7.5
'15	45.0
'16	34.0
'17	35.0
'18	33.0
'19	14.0
'20	13.0
'21	37.0
'22	24.0
'23	202.0

### Iron

Advisory standard – 0.3 ppb

- Iron does not have health impacts, but can discolor water, affect taste and stain laundry
- Occurs naturally or can come from aging pipes

Year	Worst year's
'00	0.253 ppb
'01	0.980
'02	0.029
'03	0.446
'04	0.704
'05	0.006
'06	0.276
'07	0.045
'08	0.009
'09	0.092
'10	0.005
'11	0.019
'12	0.010
'13	0.109
'14	0.084
'15	0.226
'16	0.003
'17	0.190
'18	0.230
'19	0.102
'20	0.080
'21	0.159
'22	0.210
'23	0.350

### Tetrachloroethylene

Legal health standard – 5 ppb

- Potential health risks: increased risk of cancer and liver problems
- Comes from factories and dry cleaners

Year	Worst year's
'00	3.15
'01	0.31
'02	0.95
'03	2.80
'04	2.4
'05	0.88
'06	0.33
'07	0.52
'08	0.25

### Trichloroethylene

Legal health standard – 5 ppb

- Potential health risks: increased risk of cancer and liver problems
- Comes from metal degreasing sites and other factories

Year	Worst year's
'00	0.30 ppb
'01	0.30
'02	0.66
'03	0.53
'04	0.53
'05	0.53
'06	0.53
'07	0.53
'08	0.53
'09	0.53
'10	0.53
'11	0.53
'12	0.53
'13	0.53
'14	0.53
'15	0.53
'16	0.53
'17	0.53
'18	0.53
'19	0.53
'20	0.53
'21	0.53
'22	0.53
'23	0.53

### Carbon Tetrachloride

Legal health standard – 5 ppb

- Potential health risks: increased risk of cancer and liver problems
- Comes from discharges from chemical plants and other industry.

\*Well 3 was the only well to record carbon tetrachloride and exceeded the legal standard in 2000.

Year	Worst year's
'00	8.3 ppb
'01	8.3 ppb
'02	8.3 ppb
'03	8.3 ppb
'04	8.3 ppb
'05	8.3 ppb
'06	8.3 ppb
'07	8.3 ppb
'08	8.3 ppb
'09	8.3 ppb
'10	8.3 ppb
'11	8.3 ppb
'12	8.3 ppb
'13	8.3 ppb
'14	8.3 ppb
'15	8.3 ppb
'16	8.3 ppb
'17	8.3 ppb
'18	8.3 ppb
'19	8.3 ppb
'20	8.3 ppb
'21	8.3 ppb
'22	8.3 ppb
'23	8.3 ppb

### More information on the Web

To view an interactive version of this graphic containing pollutant levels for each year, and to read articles about Madison's water, visit: [www.madison.com/wsj/water/water](http://www.madison.com/wsj/water/water)

SOURCE: Madison Water Utility; Wisconsin Department of Natural Resources; U.S. Environmental Protection Agency; State Journal research by Ron Seely

JASON KLEIN – State Journal

# Viruses found in water cause concern

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Marshfield Clinic researcher Mark Borchardt was shocked when he found viruses in water from two of three Madison Water Utility wells he tested.

The viruses weren't found at dangerous levels, Borchardt said.

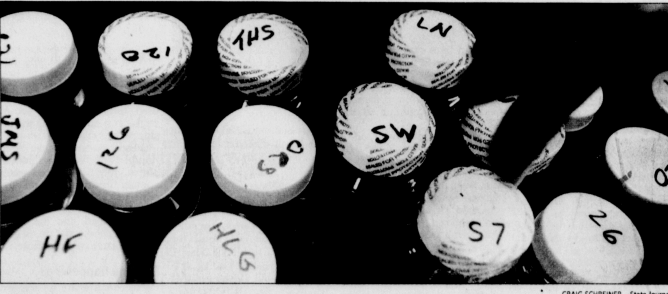
"It's their presence that concerns me," Borchardt said.

Viruses aren't supposed to be able to penetrate an aquifer as deep and naturally protected as Madison's.

But now viruses are among a growing list of so-called emerging contaminants that are not regulated in drinking water supplies by the federal Environmental Protection Agency but are of concern in both private wells and municipal water supplies.

Other worrisome contaminants rarely tested for and not regulated include pharmaceuticals, such as antidepressants and birth control drugs.

Researchers are uncertain about the health impacts of pharmaceuticals in our water. Some fear exposure to antibiotics could heighten the growing resistance of bacteria to over-used antibiotics.



Water samples for testing are taken from more than 30 sampling sites on the East and West sides in locations such as schools and fire stations.

Research has also suggested that declining sperm counts as well as increasing rates of breast, prostate and testicular cancers in humans could be related to higher levels of estrogenic compounds in the environment.

The wells sampled for viruses in Borchardt's study included Nos. 5, 7 and 24. Each is in a different part of the city; No. 5 is in South Madison, No. 7 is

on the East Side and No. 24 is on the Isthmus.

Borchardt took 10 samples from each well. None of the samples for well No. 5 came back positive. But four from well No. 7 and three from well No. 24 showed the presence of enteroviruses, a class of viruses that cause everything from colds to meningitis.

They are, according to Borchardt, being considered by the EPA for regulation.

Borchardt said the viruses can be controlled with chlorine and he questions whether the utility is adequately chlorinating drinking water.

Al Larson, chief engineer for the Madison Water Utility, said that since Borchardt's findings, the utility has increased chlorination at some wells and is keeping chlorine at a slightly higher level throughout the system.

Kenneth Bradbury, a hydrogeologist with the Wisconsin Geological and Natural History Survey who has extensively studied Madison's aquifer, said it is significant that Borchardt found viruses at such depths.

The source of the viruses remains a mystery, Bradbury said, but he added that Madison's aging water system may be a factor.

The viruses, he said, could be infiltrating the system through

a well that hasn't been lined with protective concrete or through broken pipes.

Borchardt also found viruses in four of 50 private wells throughout Wisconsin.

Now, Borchardt is conducting studies on the health impacts of viruses in drinking water. He's doing research in 14 communities across the state, though Madison is not among them.

More research has shown numerous other contaminants that are not regulated nor tested for in Dane County drinking water.

K.C. Karthikeyan, a UW-Madison researcher in the Biological Systems Engineering Department, tested water for antibiotics at several water treatment plants in Wisconsin.

Although Madison wasn't among the cities on his list, he did find antibiotics both before and after treatment at plants in Green Bay, Oshkosh, Lake Geneva, Barron-Cameron, Hayward and Spooner.

In Lake Geneva and Spooner, Karthikeyan found antibiotics in adjacent groundwater monitoring wells.

Bradbury conducted research in which he found ibuprofen and estrogenic compounds in water from septic systems in a Sun Prairie subdivision.

### Worried about your water? Here's who to contact

To find out what's in your water, visit the state Department of Natural Resources Web site at [www.dnr.state.wi.us/org/water/dwg/](http://www.dnr.state.wi.us/org/water/dwg/)

If you live in Madison and have a question about your water, you can contact the Madison Water Utility at 266-4654 or go to the utility's Web site at <http://www.madisonwater.org/index.html>.