

Dane County Parks

Transient Non-community Well

Monitoring Guidance Manual



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Dane County Parks

Dane County Land & Water Resources Department

Executive Summary

The Federal Safe Drinking Water Act and amendments and related state law administered by the Wisconsin Department of Natural Resources (DNR) require public water systems to have drinking water systems appropriately managed and monitored. The intent of this guidance manual is to ensure that Dane County Parks is providing safe drinking water to their users. This guidance manual has been developed for drinking water wells within Dane County Parks, which are designated by law as transient, non-community water systems that have lower consumption patterns, and thus, fewer legal management requirements from DNR than other types of public water systems. Specifically, there are two categories of drinking water contaminants, microbial (*E. coli*) and chemical (nitrates and nitrites) that are tested in Dane County Parks that follow DNR-enforced legal requirements for monitoring and reporting. Additionally, Dane County Parks voluntarily monitors for Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS). Currently there are no approved legally required drinking water standards established by DNR or EPA for PFAS that apply to a transient non-community water system. However, the Department of Health Services (DHS) has developed health advisory levels (HALs) for 18 PFAS that Dane County will monitor for and will provide notices when levels exceed the HALs.

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1. Drinking Water Regulations

1.1. US EPA and Wisconsin Drinking Water Regulations

The federal agency responsible for establishing public drinking water standards is the U.S. Environmental Protection Agency (EPA). However, the EPA can delegate enforcement authority to individual states. Wisconsin has received approval from EPA to enforce the provisions of the Safe Drinking Water Act (SDWA) for public drinking water regulations. These regulations are enforced by the Wisconsin Department of Natural Resources (DNR). In the DNR, the Bureau of Drinking Water and Groundwater is responsible for enforcing SDWA regulations. The DNR is also responsible for establishing and enforcing standards and regulations for water system design, construction, operation, and maintenance, well construction and placement, pumps, treatment processes, chemical addition, well filling and sealing, lab certification, and wellhead protection.

2. Public Water Supply Classifications

The classification of a public water system determines the level of regulation that a system must follow. In general, there are two water system classifications called community and non-community with each having subcategories. Non-community water systems are divided into two subcategories, non-transient non-community water system or a transient non-community water system. Specifically, community water systems and non-transient, non-community water systems are subject to stricter requirements than transient, non-community water systems. Within Dane County Parks, the drinking water wells are considered transient, non-community water systems and must adhere to the regulations within that water system classification. The following subsections provide definitions for various public water systems.

2.1. Community Water System

A Community water system (CWS) means a public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Any public water system serving 7 or more homes, 10 or more mobile homes, 10 or more apartment units, or 10 or more condominium units is a community water system unless information is available to indicate that 25 year-round residents will not be served.

2.2. Non-Community Water Systems

The law defines a non-community water system as a public water system that is not a community water system. A non-community water system is either a non-transient non-community water system or a transient non-community water system.

2.2.1. Non-transient non-community

A non-transient, non-community water system (NN) is a water system that regularly serves at least 25 of the same people for over six months of the year. EPA defines “regularly serves” as being four or more hours per day, four or more days per week for 26 weeks or more per year. Examples of NN systems include schools, day-care centers, factories, and businesses.

2.2.2. Transient Non-community

A transient non-community water system (TN) is a water system that serves at least 25 people at least 60 days of the year, but does not regularly serve at least 25 of the same people over six months of the year. Examples of TN systems include taverns, hotels, restaurants, churches, campgrounds, parks, and gas stations. **The drinking water wells within Dane County Parks are considered transient, non-community water systems.**

3. Drinking Water Standards

Drinking water standards are divided into two categories. Health related drinking water standards are called Primary Drinking Water Standards, and non-health related aesthetic standards are called Secondary Drinking Water Standards. Public water systems must provide water that meets all applicable standards for their specific system type. Both EPA and the Wisconsin Department of Health Services (DHS) have also established Health Advisory Levels (HALs) for some contaminants in groundwater and drinking water. HALs serve as technical advice for drinking water advisories and other purposes.

3.1. Primary Drinking Water Standards for Transient Non-community

Primary drinking water standards are those dealing with contaminants that are known to have an adverse effect on human health. EPA has established a limit, called a Maximum Contaminant Level (MCL), for each regulated contaminant that poses a public health risk. The maximum contaminant level or MCL is the maximum amount (concentration) of that contaminant in drinking water allowed by EPA. The EPA has determined that water containing amounts of a contaminant at or below the MCL do not pose a significant risk to public health. EPA also sets Maximum Contaminant Level Goals (MCLG). An MCLG is the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MCLGs are nonenforceable health goals.

There are primary drinking water standard requirements (MCLs) for two categories of drinking water contaminants, microbial (*E. coli*) and chemical (nitrates). All public water systems monitor for microbial contaminants plus the chemical contaminants nitrate and nitrite. **Currently, there are no approved PFAS drinking water standards established by DNR or EPA for transient non-community water systems.** Nonetheless, recent studies have shown that exposure to some Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in the environment may be linked to harmful health effects in humans and animals.

3.2. Secondary Drinking Water Standards

Secondary drinking water standards deal with contaminants that affect the aesthetic quality of drinking water. These standards apply to such contaminants as iron, manganese, color, odor, and taste. These contaminants have minimum adverse health effects; therefore, transient non-community water systems are not required by state or federal drinking water regulations to meet these standards.

3.3. Health Advisory Levels

EPA and DHS have established health advisory levels (HALs) for some contaminants. DHS has set health advisory levels for 18 forms of PFAS which are further addressed below. HALs are recommendations rather than legal requirements. They are science-based standards offered as technical advice for managing risks to groundwater and drinking water.

4. Dane County Park Wells

Drinking water in Dane County Parks is obtained from groundwater aquifers. Groundwater is generally less susceptible to contamination than surface water. Groundwater's susceptibility to contamination depends on the type and thickness of soil and rock layers, depth to the groundwater, and the type of contaminants. Some soils are very good at filtering out contaminants. Others are not. Groundwater in the central sands area and karst features of Wisconsin is very susceptible to contamination. In contrast, Dane County has rich soil and a good depth to groundwater which generally makes the groundwater less susceptible to contamination.

There are 29 Dane County Park wells that are monitored and adhere to DNR requirements for transient non-community wells. The following is a list of all Dane County Park wells.

Babcock County Park	Token Creek County Park Campground
Badger Prairie County Park	Token Creek County Park Group Camp
Brigham County Park	Token Creek County Park Shelter 1
CamRock County Park Shelter 1	Token Creek County Park Shelter 2
CamRock County Park Shelter 2	Token Creek County Park Shelter 3
CamRock County Park Shelter 3	Token Creek County Park Shelter 4
Festge County Park	Token Creek County Park Shelter 5
Fish Camp County Park	WG Lunney Lake Farm County Park Boat Launch
Goodland County Park	WG Lunney Lake Farm County Park Campground
Halfway Prairie School	WG Lunney Lake Farm County Park Group Camp
Indian Lake County Park	WG Lunney Lake Farm County Park Heritage Center
McCarthy Youth and Conservation County Park	WG Lunney Lake Farm County Park Shelter 1
Scheidegger Forest	WG Lunney Lake Farm County Park Shelter 2
Silverwood County Park	WG Lunney Lake Farm County Park Shelter 3
Stewart Lake County Park	

Water from transient, non-community wells at Dane County Park properties is used for a variety of reasons that varies across properties. Most wells, but not all, provide water for flush toilets, sinks, spigots and drinking water.

5. Contaminants and Monitoring

Drinking water effects can be separated into two categories, acute and chronic, based on their effects on humans. Acute health effects are those that are generally more immediate, occurring within hours or days of ingesting the contaminated water. Chronic health effects are those experienced after ingesting contaminated water over a period of years. Exposure to chronic contaminants can lead to a higher risk of several types of health issues including cancer, liver and kidney problems, or problems with the nervous system.

There are several sampling and monitoring actions required to ensure accurate sample results that meet state and federal drinking water monitoring requirements. A primary consideration is the collection of each water sample from an approved monitoring site location. In many cases, the monitoring locations must be listed in a monitoring site plan that is approved by the DNR.

The following is a description of the contaminant sources, monitoring requirements, sampling procedures, health effects, and treatment options for the categories of primary contaminants regulated under the Safe Drinking Water Act.

5.1. Bacteriological (*E. coli*)

5.1.1. Contaminant Sources and Health Effects

Coliform bacteria are common in the environment and most are not harmful. However, the presence of coliform bacteria in drinking water is usually the result of a problem with the well, the pressure tank, the treatment system, or the pipes that distribute water, and indicates that the water may be contaminated with germs or pathogens that can cause disease.

Drinking water is monitored for certain bacteria that could indicate that the system is vulnerable to pathogens (disease-causing microbes). Many different pathogens may be present in water. It is not practical to test for them individually. Instead, water suppliers monitor for indicator organisms. The indicator organisms used for monitoring drinking water are total coliforms, and *Escherichia coli* (*E. coli*). They are usually not found in groundwater. The presence of total coliform bacteria indicates that the water may be contaminated. If *E. coli* are detected, the water may be contaminated with human or animal wastes (fecal matter).

According to EPA guidance, the presence of disease-causing bacteria in water can cause acute health effects such as nausea, cramps, diarrhea, or headaches. For most people, these effects are short-term as their bodies can fight off microbes much the same way as they fight off germs. However, they can be dangerous or even deadly to infants, elderly, and those with weakened immune systems.

5.1.2. Monitoring Requirements

Dane County Parks samples for bacteria in their drinking water monthly, quarterly, or annually depending upon system type and sample history. All sampling is performed by Dane County Parks staff. All Dane County Park wells are seasonal so the samples may be collected up to one month prior to opening for the year until the last day of the month the season ends. Typically, samples are collected prior to opening for the year.

If total coliform or *E. coli* positive samples occur then follow up sampling is required. Follow up samples are collected within 24 hours after being notified by the laboratory of the positive sample and DNR procedures/protocols are followed. Below is a table of the sample schedule and MCL thresholds.

Water Sampling Schedule	New System	Existing System	Maximum Contaminant Level (MCL) Colony Forming Unit (CFU)
Monthly	X		0 CFU– not present
Annually		X	0 CFU– not present

5.1.3. Reporting Requirements and Corrective Actions

If *E. coli* positive samples occur, Dane County Parks reports to the DNR within 24 hours. If the water system has prior bacteriological problems, it is important to establish the source of the problem. Raw water coliform bacteria samples are collected from the well to determine if this is the source of the contamination. If the well is the contamination source, then bailing, purging, or jetting to remove sediment or debris from the well followed by shock chlorination and flushing of the system usually corrects the problem. There are other alternatives such as biofilm treatment chemicals, UV disinfection, and ozonation. Dane County Parks utilizes chlorine disinfection as the treatment option for bacteriological contamination.

5.1.4. Public Notification

If the sample tests positive for *E. coli* the well will be turned off for public use and will be treated with chlorine. During the treatment process no drinking water will be provided and the following notifications will be provided to park users within 24 hours of the MCL exceeded:

- Signage will be posted in a conspicuous location to provide notice to park users. The signage will contain at minimum the following information:
 1. Identification of *E. coli* above MCL and the sample level.
 2. When sampling occurred.
 3. Standard health language as follows: *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly and people with severely compromised immune systems.
 4. Population at risk including subpopulations that may be particularly vulnerable if exposed.
 5. What actions Dane County Parks is doing, if any.
 6. When the drinking water is expected to return to safe levels.
 7. Dane County Parks name, address, and phone number for contact and additional information concerning the notice.
 8. A statement encouraging notice recipients to distribute the notice to others.
- Sampling test results will be posted on Dane County Parks website.

5.2. Nitrate + Nitrite

5.2.1. Contaminant Sources and Health Effects

The most common sources of nitrate + nitrite (N) in drinking water are fertilizers, septic tanks, sewage, and decomposition of organic materials. N levels in groundwater may fluctuate over time depending on the source of the N.

N is an acute contaminant. According to EPA guidance, sensitive populations are susceptible to more immediate adverse health effects. Water containing high levels of N should never be fed to an infant under 6 months old. All infants under 6 months of age are at risk of N poisoning. Premature babies and babies with other health problems have an increased susceptibility to poisoning from N-contaminated drinking water. In young infants, N can reduce the blood's ability to carry oxygen and cause a condition that doctors call methemoglobinemia or “blue baby syndrome” because the skin appears blue-gray or lavender in color. Women who are or may become pregnant should not drink water with high N. People of all ages are urged to avoid long-term consumption of high N contaminated drinking water because it is linked to several chronic diseases, according to Wisconsin Division of Public Health.

5.2.2. Monitoring Requirements

Dane County Parks samples for nitrate + nitrite (N) in their drinking water annually. All sampling is performed by Dane County Parks staff. Dane County parks are seasonal so the samples may be collected up to one month prior to opening for the year until the last day of the month the season ends. Typically, samples are collected prior to opening for the year.

If nitrate + nitrite samples exceed the MCL then follow up sampling is performed and DNR procedures/protocols are followed. Below is a table of the sample schedule and MCL thresholds.

Water Sampling Schedule	New System	Existing System	Maximum Contaminate Level (MCL)
Annual Nitrate + Nitrite	X	X	10 milligrams per liter (mg/L) or 10 ppm
Nitrite N	X		1 mg/L or 1 ppm

5.2.3. Reporting Requirements and Corrective Actions

When an initial nitrate + nitrite result indicates that the MCL is exceeded (10 mg/L or 10 ppm), Dane County Parks notifies the DNR within 24 hours.

When a water system source becomes contaminated with N above the MCL, Dane County will continue to provide monitoring. Additionally, public notification will be provided as outlined below.

5.2.4. Public Notification

The following is a list of the public notifications that Dane County will provide to park users within 24 hours of the MCL exceedance:

- Signage will be posted in a conspicuous location to provide notice to park users. The signage will contain at minimum the following information:
 1. Identification of nitrate and nitrite above MCL and the sample level.

2. When sampling occurred.
 3. Standard health language as follows: Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
 4. Population at risk including subpopulations that may be particularly vulnerable if exposed.
 5. Whether alternate water supplies should be used
 6. What action consumers should take, if any.
 7. What actions Dane County Parks is doing, if any.
 8. When the drinking water is expected to return to safe levels.
 9. Dane County Parks name, address, and phone number for contact and additional information concerning the notice.
 10. A statement encouraging notice recipients to distribute the notice to others.
- Sampling test results will be posted on Dane County Parks website.

5.3. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)

5.3.1. Contaminant Sources and Health Effects

Perfluoroalkyl and polyfluoroalkyl substances, or PFAS, are a group of chemicals made by humans. Since the 1950s, PFAS have been used in many consumer products and industrial processes. They have properties that resist heat, grease, and water. There are thousands of types of PFAS. The most common types are PFOA (perfluorooctanoic acid) and PFOS (perfluorooctanoic sulfonic acid). While PFOA and PFOS have been phased out from their use in commercial products, they are still found in the environment from historical uses and in some firefighting foams. In addition, products are often made with other PFAS as replacements for PFOA and PFOS. These PFAS can be found in everyday products, such as: cleaning products; water-resistant fabrics, such as rain jackets, umbrellas, and tents; grease-resistant paper, nonstick cookware, personal care products, like shampoo, dental floss, nail polish, and eye makeup; and stain-resistant coatings used on carpets, upholstery, and other fabrics.

Scientists are conducting research in both humans and animals to see how PFAS affect us. Research studies among humans have looked at a possible link between PFAS levels in the blood and harmful health effects. However, most studies have analyzed only a small number of chemicals. Not all PFAS have the same health effects. According to Wisconsin Department of Health Services, research suggests that high levels of some PFAS may:

- Increase cholesterol levels.
- Decrease how well the body responds to vaccines.
- Increase the risk of thyroid disease.
- Increase the risk of some cancers.
- Increase the risk of conditions like high blood pressure or pre-eclampsia during pregnancy.
- Lower infant birth weights (the decrease in weight is small and may not affect health).

Concerns regarding high levels of PFAS are focused on water that is consumed. While research is still emerging, there is currently not a concern or standards regarding skin contact or air exposure such as water used for washing hands or flushing toilets.

5.3.2. *Monitoring Plan*

Currently there are no approved drinking water standards established by DNR or EPA for transient non-community water systems. The Department of Health Services (DHS) has established drinking water health advisories for 18 types of PFAS but currently these are not adopted in Wisconsin drinking water standards. Given the prevalence of PFAS in the environment and the research on health risks, for Dane County Park wells, we are taking a voluntary, proactive approach to monitor PFAS in Park wells. All sampling is performed in collaboration with Dane County Parks staff and Dane County Public Health.

Below is a table of DHS water health advisory levels (HALs) for 18 PFAS. Dane County will use these health advisory levels for public notification.

PFOA = 4 ng/L	PFNA = 10 ng/L	PFUnA = 3,000 ng/L
PFOS = 4 ng/L	PFHxS = 10 ng/L	PFBA = 10,000 ng/L
FOSA = 4 ng/L	GenX = 10 ng/L	PFTeA = 10,000 ng/L
NEtFOSA = 4 ng/L	PFDA = 300 ng/L	PFHxA = 150,000 ng/L
NEtFOSAA = 4 ng/L	PFDoA = 500 ng/L	PFODA = 400,000 ng/L
NEtFOSE = 4 ng/L	DONA = 3,000 ng/L	PFBS = 2,000 ng/L

For Community Water Systems, EPA established legally enforceable Maximum Contaminant Levels (MCLs) for six types of PFAS in two regulatory forms. One form is individual MDLs for five PFAS in drinking water: PFOA, PFOS, PFHxS, PFNA, and GenX. These MCLs are listed in bold in the table above. The second regulatory form is a Hazard Index MDL to account for the combined and co-occurring levels of least two or more of four types of PFAS in drinking water: PFHxS, PFNA, GenX, and PFBS. These MDLs are not enforceable at Dane County Park wells because they are for community water systems and not for non-community transient systems.

Just as there are no MCLs (limit requirements) set for transient non-community (TN) water systems, there are also no monitoring requirements or guidance. Dane County Parks will implement a proactive approach and to conduct a similar monitoring frequency as being conducted for Nitrates and *E. coli*. Specifically, samples will be collected annually. If the sample results are greater than or equal to the HALs, samples will be collected quarterly (or twice per year due to Dane County Parks open 6 months). If the sample results are less than or equal to the HALs, samples will be reduced for annual collection. Lastly, if the water system can demonstrate three consecutive annual samples are below the HALs, the water system will have reduced monitoring to every three years. As new guidance or requirements are set by EPA and DNR for TN water systems, the sample frequency may be updated.

5.3.3. Reporting Plan and Further Actions

When PFAS results are above the DHS health advisory levels (HALs), no reporting requirements or corrective actions are required because there are no drinking water standards required for a transient non-community water system.

Nonetheless, when a water system source becomes contaminated with PFAS above a HAL, Dane County will continue to provide monitoring. PFAS is an emerging contaminant and future information may provide other guidance. Additionally, public notification will be provided as outlined below.

5.3.4. Public Notification

While there are currently no requirements to provide public notification for PFAS, Dane County Parks will provide notification to park users like a notice for contamination with *E. coli* and nitrate exceedances. The following is a list of the public notifications that Dane County will provide to park users within 24 hours of the HAL exceedance:

- Signage will be posted in a conspicuous location to provide notice to park users. The signage will contain at minimum the following information:
 1. Identification of PFAS above HAL and the sample level.
 2. When sampling occurred.
 3. What actions Dane County Parks is doing, if any.
 4. Dane County Parks name, address, and phone number for contact and additional information concerning the notice.
 5. A statement encouraging notice recipients to distribute the notice to others.
- Sampling test results will be posted on Dane County Parks website.