DEQ Montana Department of Environmental Quality

Drinking Water Regulations Summary
Transient Water Systems

Revised

June 2016

Acronyms

ARM	Administrative Rules of Montana
BAT	Best Available Technology
CT	Concentration x Time
C	Community (Public Water Supply)
DEQ	Montana Department of Environmental Quality
DPD	N, N-diethyl-p-pheneytenediamine
EPA	Environmental Protection Agency
GWUDISW	Ground Water Under the Direct Influence of Surface Water
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
Mg/L	Milligrams per Liter
NTNC	Non-transient Non-community (Public Water Supply)
PWS	Public Water Supply
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TT	Treatment Technique
TNC	Transient Non-community (Public Water Supply)

1. INTRODUCTION

1.1 Purpose of this document

This document is designed to provide a general summary of the Montana Department of Environmental Quality (DEQ) Drinking Water Regulations for Transient Non-community Public Water Suppliers. In addition to the regulations summarized in this document, any system that utilizes a surface water source or a groundwater source under the direct influence of surface water, must comply with requirements associated with the treatment and monitoring of surface water systems summarized in the DEQ document *Surface Water Regulations Summary*.

This information is provided to assist with interpretation of the requirements, but may not cover the entire regulation. In any situation in which there is a contradiction between this document and the applicable Administrative Rule of Montana (ARM), the ARM is controlling. For a complete copy of the DEQ Drinking Water Regulations please visit http://www.deq.mt.gov/dir/legal/title17.mcpx or call (406) 444-4400.

1.2 Definitions of public water supplies

"Public water supply system (PWS)" means a system for the provision of water for human consumption from any community well, water hauler for cisterns, water bottling plants, water dispenser, or other water supply that has at least 15 service connections or that regularly serves at least 25 persons daily for any 60 or more days in a calendar year.

There are three types of public water supplies:

> ***"Community"(C)*** means a public water supply system which serves at least 15 service connections used by year-round residents or that regularly serves at least 25 year-round residents. Examples include cities, towns, nursing homes and prisons.
>
> ***"Non-transient non-community"(NTNC)*** means a public water supply system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year. Examples include workplaces and schools.
>
> ***"Transient non-community" (TNC)*** means a public water supply system that is not a community water system and that does not regularly serve at least 25 of the same persons for at least 6 months a year. Examples include restaurants, cafes, bars, campgrounds and motels.

1.3 Nature of contaminants

1.3.1. Health effects of contaminants

Acute health effects- Acute health effects are caused by sudden and severe exposure and rapid absorption of a substance. They have significant potential to have serious adverse effects on human health as a result of short-term exposure. Normally, a single exposure is enough to cause disease. Acute health effects are often reversible.

All microbial pathogens and a few chemical compounds including nitrate, nitrite, and chlorine dioxide fall into this category.

Chronic health effects - Chronic health effects are caused by prolonged or repeated exposures over many days, months or years. They have significant potential to have serious adverse effects on human health. Symptoms may not be immediately apparent. Chronic health effects are often irreversible. Most chemical and radiological compounds fall into this category. Transient water systems do not have to monitor for chemicals or radiological compounds associated with chronic health effects.

Transient water systems serve customers that vary from day to day. The water from a transient system is not generally a person's primary source of water over a lifetime. Therefore, transient systems are only required to monitor for contaminants that can cause acute health effects.

1.3.2. Types of contaminants

Montana regulations require all transient public water supplies to monitor for microbiological quality and for nitrates and nitrites.

Microbiological – include disease-causing organisms such as *Giardia*, *Cryptosporidium*, viruses, and pathogenic bacteria. Because these organisms are difficult to test for, regulations often provide for testing of indicators of microbial contamination such as turbidity and coliform bacteria. Turbidity monitoring is only required for surface water systems.

Total coliform bacteria are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful organisms may be present.

Fecal coliforms are bacteria commonly found in the intestines of warm-blooded animals and humans. Their presence indicates the water may be contaminated with human or animal wastes.

Fecal indicators are microbes whose presence indicates the water may be contaminated with human or animal wastes. Under the Ground Water Rule, acceptable fecal indicators are *E. coli*, *Enterococci* and coliphage.

E. coli are bacteria commonly found in the intestines of warm-blooded animals and humans whose presence in water is evidence of sewerage or animal waste contamination. Most *E. coli* are harmless, but some can cause serious illness. *E. coli* are both a fecal coliform and a fecal indicator.

Nitrate and nitrite are compounds found in nature or introduced by agricultural use or through disposal of animal or human waste. These compounds can cause methoglobanemia or "blue baby syndrome" in infants**.**

1.4 Requirements

Your water system has been classified as a Transient Non-Community public water supply system. As owner, manager, or operator of a transient noncommunity system, you have important responsibilities outlined in Montana law and rules associated with the protection of public health.

This document will provide a summary of the requirements associated with owning and maintaining a transient water system. They include:

Monitoring water quality

Systems are required to monitor the quality of the water they produce on a periodic basis. Transient systems monitor for microbiological quality as well as for nitrate and nitrite.

Keeping the public informed

Water systems are required to keep the public informed about the quality of the water that they are providing. Notifications of most violations as well as other situations that can have an impact on public health are required in the form of public notification.

Reporting data to DEQ

Water quality sample results as well as other reports and notices must be submitted to DEQ.

It is the responsibility of the system owner to select a state certified laboratory to perform the microbial and chemical analysis and arrange for the laboratory to send sterilized containers to collect the samples. Although most laboratories submit results directly to DEQ, it is ultimately the system's responsibility to make sure the sample results are received by DEQ. You should verify with the certified laboratory that the laboratory will submit the results.

The reporting requirements associated with each regulation and contaminant are discussed at the end of each section.

Maintaining records

Systems are also required to maintain records of microbial and nitrate/nitrite sampling, as well as other notifications, reports and statements. Records must be kept anywhere from 3 to 10 years, depending on the document. See Section 7.5 for further details.

Obtaining approval for water system improvements

Prior to installation, modification, alteration or extension of a public water supply, a system must receive written approval from the DEQ Public Water Supply and Subdivisions Bureau, Plan Review Section.

Paying service connection fees

Water systems pay an annual fee to the Public Water Supply and Subdivisions Bureau to help fund technical assistance and required compliance inspections. Fees are based on system classification and number of connections.

These requirements are described in more detail in this document. Table 1.1 provides a summary of drinking water regulations and where information on those regulations may be found in this or other documents. The hatched-out sections do not apply to transient systems.

Table 1.1 Summary of Drinking Water Regulations

	Microbial					Chemical/Radiological						Public Info	
	Total Coliform	**Ground Water Source Sampling (Fecal Indicator)**	**Surface Water Treatment (Turbidity)**	**Mandatory Disinfection Surface Water**	**Mandatory Disinfection Ground Water**	**Nitrate and Nitrite**	**IOC VOC SOC**	**Radio-nuclides**	**Lead And Copper**	**Disinfectants and Disinfection By-products**	**Fluoride Addition**	**Public Notice**	**Consumer Confidence Reports**
System Types • C • NTNC • TNC	All System Types	All System Types	All System Types	All System Types	Contaminated or At-risk Systems Only	All System Types	C and NTNC	C only	C and NTNC Systems	C and NTNC systems that provide disinfected water[2]	All systems that add fluoride	All System Types	C only
System Source • Surface • Ground • Purchase	All Source Types	Ground	Surface	Surface	Ground	Surface and Ground	Surface and Ground	Surface and Ground	All Source Types	All Source Types	All Source Types	All Source Types	All Source Types
Sampling Location	Distribution System	At Source	After individual and combined filter	After CT[3] and in distribution	At or before 1st user and may require distribution	Entry Point	Entry Point	Entry Point	Distri-bution System	Distribution System	Entry Point	N/A	N/A
Frequency	Monthly[1]	When triggered or as directed	See Require-ments	At CT[3] Continuous or Daily In Dist - Monthly	Continuous or Daily	Range from Quarterly to Annually[4]	Range from Quarterly to Every 9 years[4]	Range from Quarterly to Every 9 years[4]	See Require-ments	See Require-ments	Daily	24 hours, 30 days or 1 year (depending on tier)	Annually
Info on Requirements	Section 2	Section 3	Surface Water Regulations Summary	Surface Water Regulations Summary	Section 4	Section 5					Section 7.2	Section 6	

[1] Some small transient ground water systems may reduce to quarterly
[2] Some requirements for transient systems that use chlorine dioxide
[3] CT = concentration x contact time
[4] Frequency depends on contaminant level and system type

2. REVISED TOTAL COLIFORM RULE

Regulations regarding testing for microbiological contaminants in the distribution system are addressed in the Revised Total Coliform Rule (RTCR). Coliform bacteria, while generally not considered the cause of disease themselves, are indicators that other disease-causing organisms may be present.

Systems Affected:

All public water systems

The Revised Total Coliform Rule was finalized in Feb. 2013. The federal rule reference is 40 CFR 141subpart Y.

2.1 Monitoring Location

RTCR samples are taken in the distribution system and should be collected at sites identified in the system's sample site plan. Because most transient systems have a very limited distribution system, the sampling plan will likely be very straight forward. For systems that are completely within one building with limited plumbing, one or two sample sites may be adequate. For larger systems such as campgrounds or hotels, the sampling plan should include multiple sites that incorporate the entire system. Systems are required to submit the sample site plan to DEQ. For more information on how to create a sample site plan refer to Appendix A.

If there are multiple site locations, samples sites must be rotated until all designated routine sample sites have been sampled before a site is used again. The bacteriological report form submitted to the laboratory with the samples must identify the sample site where each sample was taken.

2.2 Sampling methods

Coliform samples are susceptible to contamination if the sample is collected in a careless manner. Appendix B gives step by step instructions on how to properly collect a coliform sample to avoid false positive samples.

Transportation time

The transportation time from when the sample is collected until it is analyzed by the laboratory must be no more than 30 hours. Systems should discuss sample collection dates with the laboratory to ensure the sample will be received in time to complete the analysis within the 30-hour period.

Sample information

Each bacteriological sample must have the proper information written on the sample bottle and report form submitted to the laboratory. The report form should include the public water system's name and PWS identification number as well as the sampler's name and phone number. Information on the bottle should include:

- sample site identification number or name as designated in sample site plan
- type of sample: routine (RT), repeat (RP), or special (SP)
- date and time the sample was collected
- location code if the sample is a repeat samples (see Table 2.3 in Section 2.5)

2.3 Routine Monitoring Requirements

Number of samples

The number of routine samples collected is dependent on the average population served by the water system during the month of peak use. Table 2.1 presents a summary of the number of routine samples a system must collect.

Frequency

Routine samples are collected monthly unless the DEQ has authorized the system to reduce sampling to once every quarter. Approval must be given in writing. Quarterly monitoring periods are based on calendar quarters: January through March, April through June, July through September, and October through December.

Reduced Sampling

All water systems must begin sampling for coliforms monthly. After 24 monthly samples, if the system has not had any positive total coliform samples, assessments or other violations , the system may request in writing to reduce their monitoring to quarterly. The system may only begin monitoring quarterly after receiving written approval from DEQ.

Increased Sampling

A system on quarterly sampling is required to return to monthly sampling if the system receives a written notification from DEQ that any of the following situations exist:

- The system has an *E. coli* positive sample
- The system has an MCL violation
- The system fails to submit a routine or repeat sample in two or more quarters
- The system constructs a system or system components or modifies a system without DEQ approval
- DEQ determines that the source or distribution system is vulnerable to contamination
- The system does not maintain or operate the system in accordance with the Revised Total Coliform Rule
- DEQ determines there is a risk to health based on sampling results, other violations issued to the system or assessments triggered by the system.

The system will return to monthly monitoring (or more frequent sampling if DEQ requires) for 12 months of system operation. After 12 months of coliform absent sampling and the resolution of other violations, the system can request quarterly monitoring again. DEQ may reduce the 12 month period if the source of the contamination has been positively identified and removed.

Table 2.1 Routine TCR Samples

Population Served	Minimum Number of Routine Samples Per Month
25* to 1,000	**1**
1,001 to 2,500	**2**
2,501 to 3,300	**3**
3,301 to 4,100	**4**
4,101 to 4,900	**5**
4,901 to 5,800	**6**
5,801 to 6,700	**7**
6,701 to 7,600	**8**
7,601 to 8,500	**9**
8,501 to 12,900	**10**
12,901 to 17,200	**15**
17,201 to 21,500	**20**
21,501 to 25,000	**25**
25,001 to 33,000	**30**
33,001 to 41,000	**40**
41,001 to 50,000	**50**
50,001 to 59,000	**60**
59,001 to 70,000	**70**
70,001 to 83,000	**80**
83,001 to 96,000	**90**
96,001 to 130,000	**100**

* Includes systems that serve less than 25 people but with at lest 15 service connections.

2.4 Other Samples

Additional routine samples

A system may take bacteriological samples beyond what is required by the routine sampling schedule. If these samples are representative of water used by customers, then the samples will be used to determine compliance with the TCR. The results of the analyses must be submitted to the DEQ.

Special sample

Special samples may only be collected on water that is not being served to the public. These samples are usually used to determine if adequate disinfection has occurred after storage tank cleaning, installation of new pipe, or pipe repair. Since these samples do not represent water consumed by the system's population, they are not counted towards routine RTCR compliance (they cannot take the place of required routine or repeat samples). However, DEQ may use these samples to determine MCL compliance.

New Source

A system shall collect at least two samples from any new source of water to demonstrate compliance before the source is connected to the public water supply.

Replacement Samples

The laboratory may request a replacement sample if the original sample was not analyzed for one of the following reasons:

- **Too Old** - the sample was collected more than 30 hours before it could be analyzed
- **Container Broke or Leaked** – the sample was compromised en route
- **Insufficient Quantity** – sample was less than 100 mL – Laboratory methods require a minimum volume of water for analysis
- **No Date/Time of Collection** – the date and time of collection must be recorded for each sample to ensure the sample was collected within 30 hours of the analysis
- **Sample Arrived Frozen or Too Hot** – after a sample freezes or is exposed to high temperatures it is no longer representative of the system's water

It is recommended systems sample early in the monitoring period so there will be enough time to take a replacement sample for repeat samples if necessary.

2.5 Coliform Positive Results

When a routine bacteriological sample is total coliform positive, the system will be required to submit repeat samples within 24 hours.

Repeat samples

The system must submit a set of repeat samples within 24 hours of being notified of the positive result. The number of repeat samples required is dependent of the number of total coliform positive samples found. Table 2.2 gives a summary of the required repeat samples following a total coliform positive sample.

Table 2.2 Repeat Samples

Number of Routine Samples/Month	Number of Repeat Samples	Triggered Source Sample for the GWR
1/Month	3 Repeat samples per each positive Routine sample	all raw water or wells that were in operation at the time of the TC+ Sample
2/Month	3 Repeat samples per each positive Routine sample	all raw water or wells that were in operation at the time of the TC+ Sample
3/Month	3 Repeat samples per each positive Routine sample	all raw water or wells that were in operation at the time of the TC+ Sample
4/Month	3 Repeat samples per each positive Routine sample	all raw water or wells that were in operation at the time of the TC+ Sample

It is the system's responsibility to have enough sample bottles on hand at all times to send in repeat samples within 24-hours. All repeat samples must be collected on the same day, unless otherwise authorized by the DEQ. The state may waive the 24-hour requirement on a case-by-case basis.

Location of Repeat Samples

At least one repeat sample must be taken from the sample site where the original total coliform positive sample was found. Other repeat samples must be collected upstream and downstream of the original total coliform positive sample site. Systems should not take all repeat samples at the same location unless they have only one sample site.

Systems are required to collect a triggered source sample (raw water or source water) for the Ground Water Rule.

The identification of the original routine sample site for the coliform positive sample shall be included on the bacteriological report for of each repeat sample. Each sample bottle should include the address or specific location the sample was taken, such as 15 Park Road, or Cabin 3 kitchen sink.

2.6 Violations and Assessments

Monitoring Violations

If a system fails to take the required routine samples it is considered a monitoring violation. Failure to collect a routine sample requires Tier 3 public notice.

Level 1 and Level 1 Triggered Treatment Technique Assessments

The Triggered Treatment Technique Assessments under the RTCR is based on the presence or absence of microorganisms and the number or percentage of samples that are found to be positive. A Triggered Treatment Technique Assessments exceedance of the RTCR can be considered acute depending on what type of microorganisms are present in the monthly samples.

Level 1 Assessments:

- if more than one sample is total coliform positive in any given month and one repeat sample is total coliform positive.
- Failure to take all required repeat samples.

Acute MCL violations and a Level 2 Assessment:

An acute MCL violation occurs when the MCL is exceeded and one of the following conditions apply:

- A routine sample is total coliform positive and any of the repeat samples associated with that routine sample are *E. coli* positive.
- A routine sample is *E. coli* positive and any of the repeat samples associated with that routine sample are total coliform positive.
- A routine sample is *E. coli* positive and the system fails to collect all required repeat samples.

This type of violation assumes an immediate health risk is present. If a system has an acute MCL violation it must take the following actions:

- Contact DEQ within 24 hours
- Issue a Boil Water Order
- Fulfill all Tier 1 public notice requirements
- Take corrective action
- Conduct a Level 2 Assessment

2.7 Reporting

Routine coliform test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a September sample is due by October 10th.

DEQ must be notified within 24-hours of any fecal coliform positive sample results. The system must also submit copies of all public notices to DEQ within 10 days of issuance.

3. 3. SOURCE SAMPLING UNDER GROUND WATER RULE

Regulations regarding testing for microbiological contaminants in ground water sources are addressed in the Ground Water Rule (GWR). The goal of the Ground Water Rule is to identify systems that are susceptible to fecal contamination and provide for increased protection of sources that are at risk.

The Ground Water Rule was finalized on November 6, 2006. The federal reference is 40 CFR 141.400-405.

3.1 Triggered Source Monitoring

When is source sampling "triggered"?

Sampling is triggered when a system has a positive routine total coliform sample in the distribution system under the RTCR and the system does not provide disinfection that meets 4-log (99.99%) inactivation of viruses.

Where is sampling required?

The system must sample at each groundwater source that was in use at the time the positive sample was taken. Sampling must be conducted prior to treatment, at the well or another location approved by the DEQ.

When must the sample be taken?

The system must take the source sample within 24 hours of being notified of the RTCR positive sample results.

What is the sample tested for?

Most systems will sample for *E. coli*. The DEQ may require that the system sample for a specific indicator.

Are there any exceptions to the required source sampling?

The DEQ may determine, on a case-by-case basis or through specified criteria, that a RTCR positive sample is the result of distribution system issues rather than source contamination. If the following conditions is met, the system is not required to conduct triggered monitoring.

- The system received approval from DEQ within 24 hours of receiving the positive sample.

What happens if a sample is fecal-indicator positive?

If a system is conducting triggered monitoring and a sample is positive for a fecal-indicator, the system must provide Tier 1 public notice within 24 hours. The DEQ may require corrective action, such as eliminating the source of contamination, removal of the contaminated source, providing an alternate source, or providing 4-log removal or inactivation of viruses.

The system is required to take 5 confirmation source samples within 24 hours of learning of the fecal indicator positive sample. If any of the 5 additional samples are fecal indicator-positive, Tier 1 public notice must be provided within 24 hours, and corrective action is required.

3.2 Assessment Source Monitoring

Assessment source monitoring is required at the discretion of DEQ. If the DEQ believes that a source or sources may be at risk, they will inform the system that assessment monitoring is required. The required monitoring criteria are also at the discretion of DEQ and may include any of the following:

Which fecal indicator must be sampled for?

DEQ may require the system to sample for *E. coli.*

Where must sampling be conducted?

DEQ may require sampling at each source, only sources that they consider at-risk sources, or perhaps at each entry point.

What frequency of sampling is required?

DEQ may require sampling at any frequency (daily, weekly, monthly, quarterly…).

How long must sampling be conducted?

Although EPA recommends one year of monitoring, DEQ may require sampling anywhere from one month to multiple years.

If a system is conducting assessment source monitoring and a sample is fecal-indicator positive, the system must provide Tier 1 public notice within 24 hours. DEQ will determine if corrective action is required.

3.3 Violations

Failure to take any required sample is a monitoring violation and requires Tier 3 public notice.

Although a fecal indicator-positive source sample in and of itself is not a violation, failure to address the contamination can result in a violation. If the DEQ requires corrective action, failure to take action or have a state-approved plan in place within 120 days of notification is a treatment technique violation and requires Tier 2 public notice.

3.4 Reporting

Routine source water test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example, a September sample result is due by October 10th.

DEQ must be notified within 24-hours of any positive sample results. The system must also submit copies of all public notices to DEQ within 10 days of issuance. Please see Section 6 for further information on public notice.

If corrective action is required by DEQ, written notice of completion of corrective action must be provided within 30 days of completion.

4. DISINFECTION

Disinfection is an effective method used to kill harmful microbiological organisms. Disinfection is required for all systems utilizing surface water, is used by groundwater systems if the source is contaminated or at risk of contamination, or if there are risks associated with the distribution system. In addition, some systems provide disinfection to prevent biofilm growth within the distribution system.

However disinfectants, in combination with certain precursors, can form disinfection by-products that have been linked to cancer and other negative health effects. In addition to the requirements discussed in this section, all systems that provide water that is chemically disinfected must comply with the requirements associated with disinfectants and disinfection by-products discussed in Section 4 of this document.

Because of the acute health effects associated with chlorine dioxide, any system that uses this disinfectant has additional monitoring and notification requirements. If your systems uses chlorine dioxide, please refer to the Drinking Water Regulations Summary - Community and Non-transient Non-community Water Systems

4.1 Mandatory Disinfection of Surface Water Systems

Any system that utilizes surface water must provide full-time disinfection of that source. For these requirements, refer to *Surface Water Regulations Summary*.

4.2 Voluntary Disinfection of Groundwater Systems

Ground water systems that choose to, but were not required to disinfect, must comply with the monitoring requirements outlined in Section 2.3.4. Groundwater systems may not begin or discontinue disinfection without prior department review and approval.

The state regulation can be found in ARM 17.38.225 and 17.38.229. There is no associated federal regulation.

4.3 Mandatory Disinfection of Groundwater Systems

Montana regulation ARM 17.38.225 and 17.38.229 set forth conditions under which ground water systems must provide full time disinfection, and provides the monitoring and minimum residual levels the system must meet.

In addition to these requirements, the federal Ground Water Rule may also require disinfection of ground water sources and sets forth treatment requirements. These requirements are presented in Section 2.3.5.

A ground water system is required to provide full-time disinfection whenever one or more of the following criteria are met:

- The water may be exposed to a potential source of contamination through loss of pressure that could result in backflow or infiltration conditions
- The water may be exposed to a potential source of contamination through substandard distribution, pumping, or storage facilities

- The water may be exposed to potential source of contamination through a treatment process
- The source is unprotected or poorly protected
- The bacteriological record does not indicate a safe supply based on the criteria listed in ARM 17.38.207 and 17.38.215
- The history or nature of contamination demonstrate that a disinfectant residual is required to ensure safe water
- Any new source drawing from an aquifer with a static water level within 25 feet of the surface

Disinfectant residual

Any system that is required to employ full-time chlorination must

- maintain a chlorine residual of no less than 0.2 mg/l or ppm at the entry point using the DPD method or
- maintain a chlorine residual of no less than 0.1 mg/l at the entry point using the amperometric titration method or
- maintain a heterotrophic plate count of less than or equal to 500 per milliliter
- a groundwater system required to maintain a residual in its operating system must maintain a minimum chlorine residual of 0.2 mg/l.

Monitoring requirements

Any system that provides full time disinfection (whether mandatory or voluntary) must take at least one disinfectant residual sample at each entry point.

The department has the authority to reduce the number of samples for non-community systems on a case-by-case basis.

Violations

Failure to conduct disinfectant residual monitoring or maintain the minimum disinfectant level constitutes a violation.

Reporting

Systems must record the chlorine residual test results on the ground water chlorination forms supplied by DEQ. Test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a September sample is due by October 10th.

4.4 Ground Water Disinfection Under GWR - 99.99 Percent Virus Inactivation

Regulations regarding disinfection of ground water sources are also addressed in the Ground Water Rule (GWR). The Ground Water Rule was finalized on November 6, 2006. Its requirements became effective on December 1, 2009. The federal reference is 40 CFR 141.400-405.

Under the GWR, systems that have contaminated ground water sources, based on fecal indicator-positive source samples, will have to take corrective action to address this contamination. One option is to provide full-time disinfection of the contaminated source that provides at least 4-log inactivation of viruses.

Other options are also available, including a combination of filtration and disinfection that provides 4-log treatment, removal of the contaminated source, elimination of the source of contamination, and providing an alternate source. Contact the DEQ for more information about the options available.

If a system is required or chooses to provide 4-log virus inactivation, the following monitoring requirements must be met to ensure that adequate treatment is provided. **Systems that meet these requirements are not subject to triggered monitoring as discussed in Section 3.1.**

Disinfectant levels

DEQ will set a minimum disinfectant concentration and/or a required CT (residual concentration x contact time) and a compliance point.

Monitoring Requirements

Systems serving more than 3,300 people must provide continuous disinfectant residual monitoring. Smaller systems may choose continuous monitoring or taking a daily grab samples at peak hourly flow.

Monitoring Violations

Failure to conduct disinfectant residual monitoring is considered a monitoring violation and requires Tier 3 public notice.

Treatment Technique Violations

If the treatment system fails to maintain the required level of disinfection for longer than a 4-hour period, a treatment technique violation is incurred and Tier 2 public notice is required.

Reporting

The lowest daily disinfectant level must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example, the September sample is due by October 10th.

The system must also report any failure to meet any treatment requirements by the end of the next business day.

5. NITRATE/NITRITE REQUIREMENTS

Systems Affected:

All public water systems

Water systems are required to sample for nitrate and nitrites under the National Primary Drinking Water Regulations. Nitrates and nitrites are contaminants that have the potential to cause both chronic and acute health issues. Nitrite (and nitrate which is converted by the body to nitrite) when in the blood supply, prevents red blood cells from carrying oxygen to the body. Infants that consume water with high levels of nitrate or nitrite can suffer from methoglobanemia or "blue baby" syndrome. If untreated, this can be fatal. Chronic exposure to high levels of nitrate or nitrite can cause diuresis, increased starchy deposits, and hemorrhaging of the spleen.

Nitrate and nitrite sampling requirements date back to the National Interim Primary Drinking Water Regulations finalized in 1977. Revised monitoring requirements took effect January 1993. State regulations regarding nitrate and nitrite monitoring can be found in ARM 17.38.203 and 17.38.216. The federal references are 40 CFR 141.23 and 40 CFR 141.62.

5.1 Maximum Contaminant Levels (MCL)

- The MCL for nitrate is 10 mg/L (as nitrogen)
- The MCL for nitrite is 1 mg/L (as nitrogen)
- The MCL for nitrate+nitrite is 10 mg/L (as nitrogen)

New sources (e.g. a new well) require an initial nitrate/nitrite sample. An initial nitrate+nitrite sample result of < 0.5 mg/L is satisfactory. For nitrate+nitrite sample results < 0.5 mg/L, no further testing is required. For nitrate+nitrite sample results > 0.5 mg/L, separate nitrate and nitrite samples are required. DEQ recommends that separate nitrate and nitrite samples be taken for new sources and subsequent compliance samples be nitrate+nitrite samples. The action level for nitrate is >50% the MCL or 5mg/L and for nitrite is ≥50% the MCL or 0.5mg/L. Increased monitoring will be required to determine the potential health risk.

5.2 Monitoring Location

Nitrate and nitrite samples are collected at each entry point to the distribution system. Sampling points must be representative of the system's sources (wells or surface) after treatment. For systems with no treatment and limited distribution, sampling in the distribution or a facility tap is adequate.

5.3 Routine Monitoring Requirements

Current nitrate sampling frequency is dictated by previous nitrate sample results. For nitrate results < 5 mg/L the requirement is one sample per calendar year. For nitrate results ≥ 5 mg/L the requirement is once per quarter for a minimum of four quarters. The quarters are January – March, April – June, July – September, and October – December. DEQ will provide written notification of monitoring schedule changes

5.4 Results Over MCL

If a sample is over either the nitrate or nitrate MCL a confirmation sample must be taken within 24 hours of notification of the exceedance. The confirmation sample results will then be averaged with the original sample. If the average of the two samples exceeds the MCL, it is then considered a MCL violation.

5.5 Violations

Monitoring

A failure to take a routine nitrate/nitrite sample requires Tier 3 public notification. Failure to take the confirmation sample requires a Tier 1 public notification.

MCL Violation

MCL compliance for nitrate and nitrite is based on the average of the initial and the confirmation sample. Exceedance of the MCL or failure to take confirmation sample requires Tier 1 public notification and completion of appropriate treatment.

- **Best Available Technologies**

  If a system cannot comply with the MCL for nitrate or nitrite, treatment may be required. EPA guidance specifies that the Best Available Technologies (BATs) for nitrate/nitrite are ion exchange, reverse osmosis, and electordialysis (nitrate only).

5.6 Reporting

Nitrate and nitrite sampling results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a 2009 annual sample is due by January 10, 2010.

Systems shall notify the DEQ and complete a public notice within 24 hours of being notified of an MCL violation or failure to take a confirmation sample.

6. PUBLIC NOTIFICATION REQUIREMENTS

The Public Notification Regulation requires system to notify customers concerning the water quality violations or situations. Despite the efforts of water suppliers, problems can and do occur. When a drinking water compliance issue arises, consumers have the right to know what happened and what they need to do. Public notification provides an opportunity to educate the public, protect public health, and build trust with customers.

EPA published the final Public Notification Regulation in 2000 to revise the general public notification regulations within the regulations in place. The State adopted the federal regulations by reference under ARM 17.38.239. The federal reference is 40 CFR 141.201-211.

6.1 What Violations and Situations Require Public Notice?

Public notice is required for the following violations and other situations that can apply to transient systems:

Violations and Situations with Acute Health Effects - Tier 1 Notice is Required

- Acute MCL violation of the Revised Total Coliform Rule
- Fecal indicator-positive source water sample
- Nitrate or nitrite MCL violations or failure to take a confirmation sample
- Occurrence of a waterborne disease outbreak or waterborne emergency
- Any other violation or situation that DEQ has determined to require Tier 1 notice

Tier 1 notices are required for violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

Violations and Situations with Non-acute Health Effects - Tier 2 Notice is Required

- Treatment technique violations if the system is required to disinfect
- Monitoring or testing violations that DEQ has elevated to Tier 2
- Failure to submit a Seasonal Startup Form
- Failure to submit a Level 1 or Level 2 Assessment form
- Failure to address Identified Deficiencies

Monitoring Violations and Other Situations - Tier 3 Notice is Required

- Monitoring or testing violations (except if DEQ elevates to Tier 1 or Tier 2)

Tier 3 notices are required for all other violations and situations not included in Tier 1 and Tier 2.

6.2 Timing and Delivery Methods for Public Notification

Table 6.1 Public Notification Deadlines and Delivery Methods

Notification Type	Deadline for Initial Notice to Public	Repeat Notices[1]	Notification Delivery Methods[2]
Tier 1	As soon as practical, but no more than 24 hours (DEQ must also be contacted within 24 hours)	As directed by DEQ	**At least one of the following methods:** Broadcast Media (radio or television), posting[3], hand delivery
Tier 2	As soon as practical, but no more than 30 days	Monthly	Posting[3] as well as any other method as needed to reach other persons regularly served by the system
Tier 3	1 year	Annually	Posting[3] as well as any other method as needed to reach other persons regularly served by the system

[1] Repeat notices as long as the violation or situation persists.

[2] Systems must use the methods listed unless directed otherwise by the DEQ in writing.

[3] Posted notices must remain up for as long as the violation or situation exists, but in no case less than 7 days.

[4] Extensions may be granted by the DEQ in writing allowing up to 3 months to give notice.

6.3 Presentation

Each public notice must be displayed in a conspicuous manner when printed or posted. However, notices must not contain overly technical language, be formatted in a way that defeats the purpose of the notice, or contain language that nullifies the purpose of the notice.

6.4 State Notification

Within 10 days of completing public notice, the system must submit to DEQ a certification that public notice was completed and include a copy of all notices delivered.

6.5 Required Content

10 Required Elements

For each violation and situation requiring notice (other than the special notice discussed below), the following must be provided in a clear and easy-to-understand manner:

(1) The violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);

(2) When the violation or situation occurred;

(3) Any potential adverse health effects from drinking the water, using mandatory language described in Section 6.6;

(4) The population at risk, including subpopulations that may be particularly vulnerable if exposed to the contaminant in their drinking water;

(5) Whether alternate water supplies should be used;

(6) Actions consumers should take, including when they should seek medical help, if known;

(7) What you are doing to correct the violation or situation;

(8) When you expect to return to compliance or resolve the situation;

(9) Your name, business address, and phone number or those of a designee of the public water system as a source of additional information concerning the notice; and

(10) A statement encouraging notice recipients to distribute the notice to others, where applicable, using the standard language provided below.

Although each of these elements must be included in the notice, the system has discretion as to how each element is addressed. For instance, there is a wide range of information that may be included for the "action consumers should take" section. For microbial issues, the consumers may be told to boil water or drink bottled water. For nitrate or nitrite, the notice may point out that boiling is not necessary (and will actually concentrate any contaminants). In some situations the response to this element may simply be that consumers do not need to take any action.

If you are not certain as to what actions consumers should take to protect their health, the DEQ or a local health department should be contacted for the appropriate information. The local health department can also help identify other system-specific information, such as vulnerable populations (e.g., children, dialysis patients) and effective communication channels for reaching them.

Content for special notice for uncorrected significant deficiency

If the DEQ has identified a significant deficiency at a transient water system and the system has not corrected it within 12 months, the system must provide a special notice. For this notice, the 10 elements discussed above are not required, but it must include a description of the deficiency, when the deficiency was identified by the DEQ, the state-approve corrective action and the schedule for corrective action.

In addition, if the system serves a large proportion of non English speaking consumers, the public notice must contain the standard language discussed in the next section.

Uncorrected significant deficiencies must also continue to be noticed annually.

6.6 Required Health Effects Language

Public notice must include specific health effects language for the contaminant of concern. Below is the text for each contaminant for which a transient systems would have to produce a notice.

Health effects language for coliform bacteria

"Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems."

***Health effects language for fecal coliform or* E. coli**

"Fecal coliforms and 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."

Health effects language for fecal indicators

"Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health 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."

Health effects language for nitrate

"Infants below the age of six months who drink water containing nitrate in excess of the MCL (maximum contaminant level) could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome."

Health effects language for nitrite

"Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome."

Health effects language for GWR treatment techniques

"Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches."

6.7 Other Required Standard Language

Other specific text that public notices are required to include are listed below.

Language to encourage the widest possible distribution of the notice to all persons served.

The following language must be included in all notices.

> *"Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail."*

Language for monitoring violations (including testing procedure violations).

The following language must be included for all monitoring and testing procedure violations:

> *"We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we ['did not monitor or test' or 'did not complete all monitoring or testing'] for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."*

Information for Non English Speaking Consumers

For a system serving a large proportion of non English speaking consumers, the public notice must contain:

- Information in the appropriate language(s) regarding the importance of the notice, or
- A phone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.

7. 7. OTHER REQUIREMENTS

7.1 Sanitary Surveys

The State is required to conduct public water systems sanitary surveys as regulated under ARM 17.38.231. The purpose of this survey is to help the system to stay in compliance with regulatory requirements as well as to provide technical assistance with operation and maintenance of the system. The surveys are completed by DEQ, or a DEQ representative, at no cost to the system. System operators must provide any necessary assistance to DEQ, or DEQ's representative, in conducting the survey.

DEQ conducts a sanitary survey of each public water system on a periodic basis. Transient systems are visited at least every 5 years. The survey consists of an on-site review of eight key elements of a water system:

- Source
- Treatment
- Distribution system
- Finished water storage
- Pumps, pump facilities, pump controls
- Monitoring, reporting and data verification
- System management and operation
- Operator compliance with state requirements

Upon completion of the survey, the site visitor will write a report and provide a copy to the system. The report will discuss the system's condition as well as any deficiencies that should be addressed.

Significant Deficiencies

Under the Ground Water Rule, effective December 1, 2009, any significant deficiency identified at a groundwater system by the DEQ must be corrected, or the system must have a state-approved plan for correction, within 120 days of being notified of the deficiency. Failure to take action is a treatment technique violation and requires Tier 2 public notice. Uncorrected significant deficiencies must also be addressed by a special annual notice.

7.2 Fluoride Addition

Some systems add fluoride to their finished water for dental benefits. While low levels of fluoride have positive benefits, fluoride at high levels can have negative impacts including causing teeth to become pitted and stain brown. Any system that adds fluoride must maintain a maximum level of 1.5 mg/L in the finished water. For a full discussion of requirements for systems that add fluoride, please refer to *the "Drinking Water Regulation Summary for Community and Non-transient Noncommunity Systems."*

7.3 Water System Improvements

The construction, alteration, extension or operation of a public water system must be approved by the DEQ. Design of a transient system must be in accordance with DEQ-3. A licensed professional engineer is required only when the complexity of the system warrants this level of expertise. All plans and specifications for improvements must be reviewed and approved by the MT DEQ Public Water Supply Section prior to construction.

Any new groundwater source must be evaluated for groundwater under the direct influence of surface water (PWS-5) determination.

Fees will be assessed for these reviews in accordance with the fee schedule.

7.4 Service Connection Fees

All public water suppliers pay an annual fee to the Public Water Supply and Subdivisions Bureau to help fund technical assistance and required compliance inspections. Fees are based on system classification and number of connections. The annual fee must be postmarked or delivered to DEQ no later than March 1 of each year.

7.5. Recordkeeping

Systems are required to keep test analyses results, public notice, and other records on file. Keeping the documents can be helpful in noticing system patterns and may be used to clear up any inconsistencies between records held elsewhere.

State regulations regarding recordkeeping can be found in ARM 17.38.234. The federal regulation is 40 CFR 141.31-35.

The following table is a general outline of records public water systems are required to keep and the length of time the records are required to be kept.

Table 7.1 Recordkeeping for Transient Systems

Records	Timeframe
Corrective Action for Violations	At least 3 years
Public Notices	At least 3 years
Microbiological analyses	At least 5 years
Nitrate and nitrite analyses	At least 10 years
Sanitary surveys and written reports	At least 10 years

Appendix A – Revised Total Coliform Sample Site Plan Guidelines

A coliform sample site plan should be prepared by the owner or someone familiar with the public water system and sampled in accordance with the Revised Total Coliform Rule. To ensure samples are representative, routine sample sites shall be evenly spaced throughout the area of the distribution system. Routine sample sites shall be selected to sample water in the distribution system from each water source, storage tank, reservoir, or pressure zone. Sample sites must be rotated each time a routine sample is collected.

Plans are subject to State DEQ review and revision. The sample site plans shall be submitted to the department within 30 days of system startup date. The sample site plan will be placed in the department's files and reviewed during sanitary surveys and field inspections. The plan is also used by the department to help a system research a contamination problem.

Table B-1 Minimum Routine Sample Sites

Service Connections	Sample Sites
1	1
2 to 10	2
11 to 100	3
101 to 500	4
>500	5

At a minimum, the sample site plan should include:

- A map of the water distribution system showing the location of each routine sample site, water source, treatment facility, storage tank, reservoir, and the boundaries of each pressure zone if possible.
- A description of the monthly sampling rotation cycle. The required number of monthly routine samples may be less than is necessary to cover all pressure zones and areas served by each source and reservoir. In such cases, sample locations should be rotated on a monthly basis. Systems are strongly encouraged to monitor each pressure zone at least once every three months.
- A location description, including the business name, and street address where available, for each routine sample site.

Sample Site Requirements:

- No routine sample sites may be the last service connection from a dead end of the water distribution system.
- Repeat sample sites shall be available within 5 service connections both upstream and downstream of each routine sample site, if possible. If the system does not have enough connections, then the repeat samples should be representative of the distribution system.
- Small systems may, if necessary, collect repeat samples at one or more of the other routine sample sites if they are located within five service connections of the original coliform positive routine sample site.

Recommendations for selection of sample sites:

- Plumbing should be inspected to ensure there are no cross-connections with non-potable water sources
- The sampling tap should be free of any aerators, strainers, hoses, or water treatment devices.
- Leaking taps that allow water to flow to the outside of the tap should be avoided.
- Routine sample sites should be accessible daily, throughout the entire year.
- Do not sample after treatment processes such as softeners that are not maintained by the PWS, as these devices can harbor bacteria.
- No routine sample sites may be the last service connection from a dead end of the water distribution system if possible.
- Repeat sample sites should be available within 5 service connections both upstream and downstream of each routine sample site.
- Small systems may, if necessary, collect repeat samples at one or more of the other routine sample sites if they are located within five service connections of the original coliform positive routine sample site.

Appendix B - How to Take a Bacteriological Sample

Sample Collection and Procedure

Bacteriological samples are at risk to contamination and false positive results if not sampled properly. It is important to collect a sample properly to ensure bacteria do not contaminate the otherwise clean water.

The laboratory that supplies the sampling containers normally provides instruction with the sampling kit for the type of monitoring you are doing. Refer to those instructions when provided. The following instructions give a general sampling procedure for collecting coliform samples.

Collecting the Sample

1. Select a good faucet to sample from – not leaking, non-swivel, not a drinking fountain or outside hydrant.
2. Remove any faucet attachments – aeration screens, hoses, etc.
3. Flush the tap by opening it fully and letting the water run for 2 to 3 minutes
4. Reduce the flow to avoid splashing when collecting the sample
    - Flow should be about the diameter of a pencil
    - Avoid allowing the water to contact the metal rim of the faucet
5. Fill in the label on the bottle.
6. Remove the bottle cap
    - Do not touch the inside of the cap or bottle
    - Do not set the cap down anywhere
7. Fill the bottle to the neck or fill line.
    - Do not touch the bottle to the faucet
    - Do not rinse out the bottle (the white powder neutralizes any chlorine in the water)
8. Replace the cap
9. If you think you have contaminated the sample or bottle, start over with a new bottle; it can save time and money.