Drinking Water Regulations Summary
Community and Non-Transient Non-Community Water Systems

Revised

June 2016

Acronyms

AL	Action Level
ARM	Administrative Rules of Montana
BAT	Best Available Technology
CCR	Consumer Confidence Report
CCT	Corrosion Control Treatment
CEC	Continuing Education Credit
CT	Concentration x Time
C	Community (Public Water Supply)
DPD	N, N-diethyl-p-pheneytenediamine
DBP	Disinfection Byproduct
DBPR	Disinfectants and Disinfection Byproduct Rule
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
GWUDISW	Ground Water Under the Direct Influence of Surface Water
GWR	Ground Water Rule
HAA5	Five Haloacetic Acids
IDSE	Initial Distribution System Evaluation
IOC	Inorganic Chemical
LCR	Lead and Copper Rule
LCR STR	Lead and Copper Rule Short Term Revisions
LSLR	Lead Service Line Replacement
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
MCL	Maximum Contaminant Level
MCLG	Method Detection Limit
MFL	Million Fibers per Liter
Mg/L	Milligrams per Liter
MRDL	Maximum Disinfectant Residual Levels
MRDLG	Maximum Disinfectant Residual Levels Goal
MREM/YR	Millirems per Year
NTNC	Non-Transient Non-Community (Public Water Supply)
NTU	Nephelometric Turbidity Unit
OCCT	Optimal Corrosion Control Treatment
OEL	Operational Evaluation Level

OWQP	Optimal Water Quality Parameter
PCBs	Polychlorinated Biphenyls
pCi/L	Picocuries per Liter
PWS	Public Water Supply
PPM	Parts per Million
PPB	Parts per Billion
PPT	Parts per Trillion
PPQ	Parts per Quadrillion
RTCR	**Revised Total Coliform Rule**
SMCL	Secondary Maximum Contaminant Level
SOC	Synthetic Organic Chemicals
STR	Short Term Revisions (see LCR STR)
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TOC	Total Organic Carbon
TT	Treatment Technique
TTHM	Total Trihalomethane
TNC	Transient Non-Community (Public Water Supply)
VOC	Volatile Organic Chemical
WQP	Water Quality Parameters

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 Community and Non-transient Non-community Public Water Supplies. Any system that utilizes a surface water source or a ground water 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 (Montana Department of Environmental Quality) Drinking Water Regulations please visit http://www.deq.mt.gov/dir/legal/title17.mcpx or call (406) 444-4400.

1.1.1 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.

1.2 Nature of Contaminants and Other Regulated Compounds

Community systems serve a year-round population and non-transient non-community water systems regularly serve the same individuals over six months of the year; therefore regular monitoring must be conducted for contaminants that can have an adverse impact on human health.

1.2.1 Types of contaminants and compounds

Montana regulations require all community and non-transient non-community public water supplies to monitor for microbiological quality.

> ***Microbial*** – 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.
>
> > **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.

Chemical – include organic and inorganic contaminants that may be found in the source or may enter soils and groundwater through unregulated releases, as well as compounds that may be added to the water such as disinfectants or fluoride; or that may be introduced to water in the distribution system due to the chemical nature of the water such as lead, copper, and disinfection by-products.

Radiological – includes uranium, radium 226, radium 228, gross alpha, beta particles and photon emitters.

1.2.2 Health effects of contaminants and compounds

Acute health effects

Acute health effects are characterized by sudden and severe onset of illness after 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 may be 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.

A comprehensive list of all the contaminants, Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, and health effects are included in Appendix C.

1.3 Requirements

Your water system has been classified as a Community Water System (C) or Non-transient Non-Community (NTNC) public water supply system. As owner, manager, or operator of a community system, you have important responsibilities outlined in Montana law and rules associated with the protection of public health. The term "system" as used throughout this document refers to the owner, manager or operator as applicable.

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

Monitoring water quality

Systems are required to monitor the microbial, chemical and radiological quality of the water they produce on a periodic basis. Monitoring frequency is based on the chemical or contaminant. Some chemicals are monitored continuously; others are monitored daily, monthly, annually, triennially, and for some situations sampling is conducted every 9 years. The location of sampling depends on the nature and source of the contaminant or

compound. Some monitoring is conducted at the "entry point" (a point after treatment, but prior to the delivery of water to the public) and others are taken within the distribution system itself.

Keeping the public informed

Water systems are required to keep the public informed about the quality of the water that they are providing. Notice of most violations as well as other situations that can have an impact on public health are required in the form of public notification. In addition, community systems are required to provide an annual water quality report to their customers in the form of a consumer confidence report.

Maintaining records and reporting data to DEQ

Water quality sample results as well as other reports and notices must be submitted to DEQ. Most laboratories submit results directly to DEQ; however the system is ultimately responsible to make sure the sample results are received by DEQ. The reporting requirements associated with each regulation and contaminant are discussed at the end of each section.

Systems are also required to maintain records of microbial, chemical, and radiological sampling, as well as other notifications, reports and statements. Records must be kept anywhere from 3 to 12 years, depending on the document, see Section 9.1 for further details.

Operator certification

Operators of community and non-transient non-community public water systems are required to obtain a level of certification appropriate for the type and size of system and type of water treatment that the system employs. Certified operators are required to pay an annual renewal fee to maintain their active status. A fully certified operator must earn continuing education credits during each two year training period that commences on June 1 of each even-numbered year in order to maintain their certification.

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.

Table 1.1 provides a summary of drinking water regulations and where information on those regulations may be found in this or other documents.

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	Continuous or Daily[5]	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 2.1	Section 2.2	Surface Water Regulations Summary	Surface Water Regulations Summary	Section 2.3	Section 3.1	Section 3.2	Section 3.3	Section 3.4	Section 4	Section 5	Section 7	Section 8

[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
[5] Depends upon type of system. Could be one of 3 different requirements.

2. MICROBIOLOGICAL REQUIREMENTS

System owners are responsible for selecting a state certified laboratory to perform the microbiological analysis and arrange for the laboratory to send sterilized containers to collect the samples. Most laboratories submit results directly to DEQ; however the system is ultimately responsible to make sure the bacteriological sample results are received by DEQ. It is recommended that the system verify with the certified laboratory that the laboratory will submit the results. The water system is responsible for the cost of all analyses collected by a certified person.

2.1 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, and implemented in April 2016.The federal rule reference is 40 CFR 141, Subpart Y

2.1.1 Monitoring Location

RTCR samples are taken in the distribution system, and should be collected at sites identified in the system's sample site plan. The system must create and submit to DEQ a sample site plan to ensure the sites are representative of the entire distribution system. Some community systems and most non-transient non-community systems have a limited distribution system. Sampling plans for these systems will likely be very straight forward. Systems that are completely within one building with limited plumbing may have one or two sample sites. Sampling plans for larger systems will include multiple sites that incorporate the entire system. Refer to Appendix A for more information on how to create a sample site plan.

Sample sites must be rotated until all designated 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 sites where each sample was taken.

2.1.2 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 must be no more than 30 hours from when the sample is collected until it is analyzed by the laboratory. Systems need to 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 must include the public water system's name and PWS identification number as well as the certified sampler's name and phone number. Information on the bottle includes:

- 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 name or identification if the sample is a repeat samples

2.1.3 Routine Monitoring Requirements

Number of samples

The number of routine samples collected is dependent on the average daily 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 shall be collected monthly.

DEQ may increase the required sampling frequency of any system based upon sample results or other conditions that indicate a risk to public health. DEQ shall provide the water system with a written explanation of any revised sampling requirements. A system shall implement any increase in sampling frequency immediately upon receipt of the written notice.

Routine samples must be collected at regular time intervals throughout the month if your system serves more than 4,900 people and uses only ground water (except ground water under the direct influence of surface water). If your system serves 4,900 or fewer you may collect all of the samples on the same day, but they must be at different sample sites.

2.1.4 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 in determining compliance with the Revised Total Coliform Rule. All sample results must be submitted to DEQ.

Special sample

Special samples may only be collected on water that is not being served to the public and need prior approval from the department. 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 (maximum contaminant level) 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.

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 least 15 service connections.

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.

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

2.1.5 Coliform Positive Results

When a routine bacteriological sample is total coliform positive, the system will be required to submit repeat samples within 24 hours and will be required to conduct increased monitoring the next month.

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.

The system is responsible 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 DEQ. The state may waive the 24-hour requirement on a case-by-case basis.

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

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 should be collected within five service connections upstream and downstream of the original total coliform positive sample site. Do not take all repeat samples at the same location unless the system has only one service connection.

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 should 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.

1.1 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 Assessment:

- if more than one sample is total coliform positive in any given month and/or 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

2.1.6 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 coliform positive sample results. The system must also submit copies of all public notices to DEQ within 10 days of issuance.

2.2 Source Sampling Under the 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. Its requirements went into effect on December 1, 2009. The federal reference is 40 CFR 141.400-405.

Systems Affected:

All public water systems with groundwater sources or who purchase groundwater

2.2.1 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?

For each RTCR positive routine sample, the system must sample at each ground water 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 TCR 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 one of 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 has a fecal-indicator positive sample, the system must provide Tier 1 public notice within 24 hours.

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.

2.2.2 Assessment Monitoring

Assessment monitoring is required at the discretion of the state. 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 (Environmental Protection Agency) recommends one year of monitoring, DEQ may require sampling anywhere from one month to multiple years.

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

2.2.3 Violations

Monitoring Violations

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

Treatment Technique Violations

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. Failure to take DEQ required 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.

2.2.4 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, any 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.

Written notice of completion of DEQ required corrective action must be provided within 30 days of completion.

2.3 Disinfection

Disinfection is an effective method used to kill harmful microbiological organisms. Disinfection is required for all systems utilizing surface water, groundwater under the direct influence of surface water or ground water 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.

Systems Affected

All public water systems

2.3.1 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.*

2.3.2 Voluntary Disinfection of Ground Water Systems

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

The state regulation can be found in ARM 14.38.225 & 229. There is no associated federal regulation.

2.3.3 Consecutive Systems

Systems that purchase chlorinated water must comply with the chlorine residual monitoring requirements. Surface water purchase consecutive systems must monitor at both the entry point to the distribution system and in the distribution system. Groundwater purchases consecutive systems must monitor at the entry point to the distribution system. The entry point is generally at or near the master meter for the consecutive connection.

The state regulation can be found in ARM 14.38.225 & 229. There is no associated federal regulation.

2.3.4 Mandatory Disinfection of Ground Water Systems

Montana regulation ARM 14.38.225 and 14.38.229 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 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 ground water system required to maintain a residual in its distribution system must maintain a minimum chlorine residual of 0.2mg/l.

Monitoring requirements

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

Violations

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

Reporting

Groundwater 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 all September sample results are due by October 10th.

2.3.5 Ground Water Disinfection Under the 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 2.2.**

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, all September sample results are due by October 10th.

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

3. CHEMICAL REQUIREMENTS

The system owner is responsible for selecting a state certified laboratory to perform the chemical analysis and arrange for the laboratory to send sterilized containers to collect the samples. Follow the directions for sample procedures sent by the laboratory with the sample bottles. Although most laboratories submit results directly to DEQ, the system is ultimately responsible to make sure the test results are submitted. It is recommended that the system verify with the certified laboratory that the laboratory will submit the results. The water system is responsible for the cost of all analyses.

3.1 Nitrate/Nitrite Monitoring 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 acute and chronic 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 metheoglobinemia or "blue baby" syndrome. This can be fatal if untreated. 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.

3.1.1 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, 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.Nitrate and nitrite samples shall be collected at each entry point to the distribution system. Sampling points 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, 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.

3.1.2 Routine Monitoring Requirements

Initially all systems must sample as follows:

Initially all systems sample

Ground water systems must sample annually.

Surface water systems must sample quarterly.

Monitoring may be reduced or increased based, on results. DEQ will provide written notification of monitoring schedule changes.

3.1.3 Reduced Monitoring

In some situations, monitoring may be reduced:

- **Ground water systems** cannot reduce to less than annual.
- **Surface water systems** may reduce their monitoring to annually if four consecutive quarter samples are less 50 percent of the MCL. The surface water system must then take quarterly samples in the quarter that previously yielded the highest analytical results. The system must receive written approval before beginning reduced monitoring.

DEQ will provide written notification of monitoring schedule changes.

3.1.4 Increased Monitoring

In some situations, monitoring may be increased:

- **Ground water systems** will be increased to quarterly monitoring if any annual sample is greater than or equal to 50 percent of the MCL. DEQ may return the ground water system to annual monitoring if four consecutive quarterly samples are "reliably and consistently" below MCL.
- **Surface water systems** previously reduced to annual monitoring shall return to quarterly monitoring if any sample is greater than or equal to 50 percent of the MCL. DEQ may return the surface water system to annual monitoring if four consecutive quarterly samples are less than 50 percent of the MCL.
- Any System that treats for Nitrate/Nitrite may have increased monitoring, to monitor the effectiveness of the treatment.

DEQ will provide written notification of monitoring schedule changes.

3.1.5 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. It is considered an MCL violation if the average of the two samples exceeds the MCL. If no confirmation sample is taken, then the MCL is based on original sample result.

3.1.6 Violations

Monitoring Violations

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 notice.

MCL Violation

MCL compliance for nitrate and nitrite are 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 resolve nitrate MCL.

- **Best Available Technologies**
  One Option to comply with nitrate MCL is to install nitrate removal system.EPA guidance specifies that the Best Available Technologies (BATs) for nitrate/nitrite are ion exchange, reverse osmosis, and electordialysis (nitrate only).

3.1.7 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 2016 Annual is due by January 10, 2017.

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

3.2 Inorganic, Volatile Organic and Synthetic Organic Compounds

Systems Affected:

All community systems

Water systems are required to sample for eleven inorganic chemical (IOC) contaminants as well as volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs) under the National Primary Drinking Water Regulations. The presence of these contaminants in drinking water is a health concern primarily due to their potential ability to cause cancer when consumed over long periods of time. The health effects associated with each contaminant are listed in Appendix C.

IOCs, VOCs, and SOCs are regulated under the Phase II and Phase V Rules, which went into effect in 1992, 1994 respectively. These rules built on the National Primary Interim Drinking Water Regulations by requiring monitoring and setting MCLs for additional contaminants. In addition, the Arsenic standard was revised under the Arsenic Rule which became effective in 2002 and was revised in 2006 to reduce the MCL.

State regulations regarding these contaminants can be found in ARM 17.38.203 and 17.38.216. The federal references are 40 CFR 141.23-24 and 40 CFR 141.61-62.

3.2.1 Maximum Contaminant Levels

A table summarizing the Maximum Contaminant Levels (MCLs) for inorganic, volatile organic, and synthetic organic compounds that are regulated under the Safe Drinking Water Act is included in Appendix C.

Arsenic

Although arsenic is regulated in an individual rule, it is included in the list of inorganic chemicals. Monitoring requirements listed below apply to the new arsenic standard.

Fluoride

At low levels, fluoride can help prevent cavities, but at higher levels fluoride may cause cosmetic discoloration of children's permanent teeth. For that reason, in addition to the MCL of 4.0 mg/L for fluoride, EPA has set a secondary MCL (SMCL) of 2.0 mg/L. Exceedance of the SMCL is not a violation, but public notice is required to inform consumers.

3.2.2 Monitoring Location and Compositing

Inorganic, volatile organic, and synthetic organic samples must be collected at each entry point to the distribution system. Ground water systems must collect one sample at each entry point that is representative of each source of water after treatment. Surface water systems must collect one sample at a point that represents each source or at each entry point after treatment. Compositing of up to 5 sample points is allowed. If a composited sample exceeds 1/5 of the MCL, individual samples from each sample point must be collected and analyzed, this is only true if 5 samples were composited.

3.2.3 Monitoring and the Standardized Monitoring Framework

Inorganic, volatile organic, and synthetic organic compounds monitoring requirements follow the Standardized Monitoring Framework developed by EPA to streamline drinking water monitoring requirements. EPA has established nine-year cycles that are broken into smaller monitoring periods. Each nine-year cycle is comprised of three three-year compliance periods. Each three-year compliance period may be further divided into annual, quarterly, and monthly periods. Waivers obtained from DEQ may allow water systems to reduce their monitoring to a longer compliance period.

3.2.4 Routine Monitoring

Initially systems follow routine monitoring requirements. Monitoring may be reduced or increased based on results.

Inorganics

Systems are required to conduct routine sampling for inorganic chemicals. The sampling frequency depends on the type of source water.

- **Ground water systems** are required to collect one sample per three-year compliance period.
- **Surface water systems** are required to collect one sample annually.

Volatile and Synthetic Organics

Initially systems are required to collect four consecutive quarterly samples for volatile and synthetic organics.

3.2.5 Reduced Monitoring

Inorganic Compounds

A waiver for reduced monitoring of inorganics may be granted by DEQ provided surface systems have monitored annually for 3 consecutive years and ground water systems have conducted a minimum of 3 rounds of monitoring. The frequency of the monitoring is determined by DEQ.

Volatile Organic Compounds

If no VOCs are detected during the initial round of sampling, systems may be allowed to decrease their sampling frequency beginning in the second compliance period.

- **Ground water systems** must take at least one sample each year at each sampling point. After three consecutive years of annual sampling with no detection, sampling at that point may be further reduced to one sample every three years. The initial year of quarterly sampling may count as one of the three years of no detection.
- **Surface water systems** must sample annually.

Synthetic Organic Compounds

Systems may be allowed to decrease their sampling frequency in the second and subsequent compliance periods for contaminants undetected during the initial compliance period.

- Systems serving more than 3,300 people may reduce their sampling frequency to two samples every 3 years.
- Systems serving □ 3,300 or fewer people may reduce their sampling to one sample every three years.

3.2.6 Increased Monitoring

Inorganic Chemicals

Any inorganic chemical sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. The monitoring frequency may be later reduced when the compound levels are shown to be "reliably and consistently below the MCL." This will require a minimum collection of 2 consecutive quarterly samples for ground water systems and 4 consecutive quarterly surface water samples.

Volatile Organic Compounds

If a sampling exceeds the method detection limit (MDL) of 0.0005 mg/l for any VOC, the water system must begin quarterly sampling at that point in the next calendar quarter and must continue sampling quarterly until DEQ determines the sampling point is reliably and consistently below the MCL.

Synthetic Organic Compounds

If a synthetic organic contaminant is detected at any sampling point, the water system must begin sampling quarterly at that sampling point in the next quarter and continue sampling quarterly, until DEQ determines that the sampling point is reliably and consistently below the MCL.

Confirmation Samples

Confirmation samples may be required within 2 weeks of an exceedance.

3.2.7 Results over MCL

Any inorganic, volatile organic, and synthetic organic compounds sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. A system is not considered in violation of the MCL until it has completed one year of triggered increase sampling and the sample results based on a Running Annual Average exceed the MCL.

3.2.8 Violations

Monitoring Violation

A failure to take any required sample for IOC, VOC, and/or SOC constitute a monitoring violation and requires a Tier 3 public notice be issued.

MCL Violation

MCL compliance for inorganic, volatile organic, and synthetic organic compounds is based on a running annual average of quarterly monitoring. MCL violations require a Tier 2 public notice be issued.

- **Best Available Technologies**

  If a system cannot comply with the MCL for IOCs, VOCs and SOCs, treatment may be required. EPA guidance provides specific Best Available Technologies (BATs) for each contaminant. Refer to 40 CFR 141.61(b) for organics and 40 CFR 141.62(c) for inorganics.

3.2.9 Statewide Waivers

Under the statewide waivers, public water supplies are not required to sample for:

Endothall	Dioxin	Asbestos at the source
Diquat	Ethylene dibromide	Cyanide
Glyphosate	Dibromochloropropane	

Additionally, small water systems (3,300 or less) may be waived from initial quarterly monitoring requirements for the organic chemicals (includes VOCs, PCBs, SOCs) by completing one round of organic chemical sampling without detects. This statewide waiver applies only to initial baseline requirements. Repeat sampling during subsequent compliance periods will be required except where "use" or "susceptibility" waivers have been granted.

Additional information for state-wide waivers is provided in the Appendix D.

3.2.10 System-Specific Waivers

Containment specific waivers are available dependent upon a systems susceptibility to containment which can include: historical sample results, land use, hydrology surrounding the system. For more info please contact DEQ.

Additional information regarding system-specific waivers is provided in the Appendix D.

3.2.11 Reporting

Chemical contaminant sampling 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.

Systems Affected:

All community systems

3.3 Radiological Contaminants

Water systems are required to sample for radiological contamination under the National Primary Drinking Water Regulations. Long-term exposure to radionuclides may cause cancer. In addition, exposure to uranium may have toxic effects on the kidneys. The health effects associated with each contaminant are listed in Appendix C.

The Radionuclides Rule, finalized in December 2000 built on the requirements existing in the National Primary Interim Drinking Water Regulations by adding an MCL for uranium and revising the monitoring requirements.

State regulations regarding radiological monitoring can be found in ARM 17.38.206 and 17.38.216. The federal references are in 40 CFR 141.25-26 and 40 CFR 141.66.

3.3.1 Maximum Contaminant Levels

A table summarizing the Maximum Contaminant Levels (MCLs) for Radiological Contaminants is included in the Appendix C. Radiological contaminants regulated under the Safe Drinking Water Act are Radium-226 and Radium-228 (combined), gross alpha particle activity, Uranium, and gross beta particle activity. MCL compliance for radionuclides is based on a running annual average.

3.3.2 Monitoring Location and Compositing

Radionuclide samples must be collected from each entry point to the distribution system. For gross alpha activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if the analysis is done within a year of the first sample.

3.3.3 Routine Monitoring

Systems must collect four consecutive quarterly samples at all sampling points for gross alpha particle activity, radium-226, radium-228, and uranium monitoring. Systems designated as vulnerable by DEQ must collect quarterly samples for beta particle emitters and annual samples for tritium and strontium-90.

Vulnerable systems must collect quarterly samples for beta particle emitters and annual samples for tritium and strontium-90.

3.3.4 Reduced Monitoring

A system may go to a reduced sampling schedule for gross alpha particle activity, radium-226, radium-228, and uranium monitoring if the average sample results from routine sampling are less than or equal to the MCL. There are four options for reduced monitoring based on sample results:

Table 3.1 Reduced Monitoring Options for Alpha Particle Activity, Radium-226, Radium-228, and Uranium

If the Running Annual Average is:	Then Reduced Monitoring is:
< Detection Limit	One sample every 9 years
≥ Detection Limit but ≤ ½ MCL	One sample every 6 years
>1/2 MCL but ≤ MCL	One sample every 3 years

The system may reduce monitoring to one sample every 3 years if the gross beta particle activity minus the naturally occurring potassium-40 activity is ≤ 50 pCi/L (picocuries per liter),.

3.3.5 Increased Sampling

Systems must use the samples collected during the reduced monitoring to determine the monitoring frequency for subsequent monitoring periods. This could increase the monitoring frequency.

Any gross alpha particle activity, radium-226, radium-228, or uranium sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. Monitoring frequency may be reduced when the system has results from four consecutive quarters that are below the MCL. The system must speciate as required by DEQ and sample at the initial monitoring frequency if gross beta particle activity minus the naturally occurring potassium-40 activity exceeds 50 pCi/L.

If a beta particle or photon emitter sample exceeds the MCL, the system must conduct monthly monitoring the following month at that sample point.

Table 3.2 Reduced Monitoring Options for Gross Alpha Particle Activity

If the Running Annual Average is:	Then Reduced Monitoring is:
< Detection Limit	One sample every 9 years
≥ Detection Limit but ≤ ½ MCL	One sample every 6 years
>1/2 MCL but ≤ MCL	One sample every 3 years

3.3.6 Violations

Monitoring Violation

A failure to take any required sample for radionuclides constitutes a monitoring violation and requires a Tier 3 public notice be issued within 1 calendar year.

MCL Violation

MCL compliance is based on the running annual average. Radiological contaminants MCL exceedance violations require Tier 2 public notice be issued.

- **Best Available Technologies**

  For radioactive contaminants, there are non-treatment options as well as Best Available Technologies specific to the radionuclide of concern. For more details, refer to 40 CFR 141.66(g) or contact DEQ.

3.3.7 Reporting Requirements

Radiological contaminant test results 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.

3.4 Lead and Copper

Systems Affected:

All Community and NTNC systems

Control of lead and copper in drinking water is addressed in the Lead and Copper Rule (LCR). It was developed to reduce the risk of expose to lead that can cause damage to the brain, red blood cells and kidneys, especially for infants, young children and pregnant women, as well as to reduce the expose to copper that can cause stomach and intestinal distress, liver or kidney damage, and complications of Wilson's disease.

The LCR protects public health by minimizing lead and copper levels in drinking water, primarily due to water corrosivity. It establishes action levels (ALs) based on tap water sampling. Exceedance of these ALs can trigger additional requirements for the system such as: water quality parameter (WQP) monitoring,optimal corrosion control treatment (OCCT), source water monitoring/treatment, public education, and lead service line replacement (LSLR).

The original Lead and Copper Rule (LCR) became effective in 1992. In October 2007, EPA published revisions to the LCR. These new requirements became effective in December 2007. The revisions are meant

to enhance the implementation of the LCR in areas of monitoring, treatment, customer awareness and LSLR, as well as, improve compliance with public education requirements. The revisions also ensure drinking water customers receive information needed to help them limit their exposure to lead in drinking water. See Appendix E for a summary of these revisions.

State regulations regarding lead and copper can be found in ARM 17.38.203, 208, 216 and 234. The federal references are 40 CFR 141.40-43 and 40 CFR 141.80-91.

3.4.1 Lead and Copper Tap Monitoring

All Community (C) and Non-transient non-community (NTNC) water supplies must collect first-draw samples at taps in homes/building that are at high risk of lead and copper contamination. The LCR establishes a tiering system for prioritizing sampling sites (see table below). A materials evaluation is required to help classify sampling sites into tiers.

Table 3.3 Tier Classification

Community	NTNC
Tier l sampling sites are single family residences (SFR): • with copper pipes with lead solder installed after 1982 *(but before the effective date of the State's lead ban)* or contain lead pipes; and/or • that are served by a lead service line. *Multiple-family residences (MFRs) may count as Tier 1 sites when they comprise at least 20% of the structures served by the system.*	**Tier l** sampling sites consist of buildings: • with copper pipes with lead solder installed after 1982 *(but before the effective date of the State's lead ban)* or contain lead pipes; and/or • that are served by a lead service line.
Tier 2 sampling sites consist of buildings, including MFRs: • with copper pipes with lead solder installed after 1982 *(but before effective date of the State's lead ban)* or contain lead pipes; and/or • that are served by a lead service line.	**Tier 2** sampling sites consist of buildings with copper pipes with lead solder installed before 1983.
Tier 3 sampling sites are SFRs with copper pipes having lead solder installed before 1983.	**Tier 3**: Not applicable.
Representative Sample: Community or non-transient non-community systems that cannot collect enough samples from tiered site's, must collect them from sites where the plumbing is similar to that used at other sites served by the water system.	

Samples must be collected at Tier 1 sites. If an insufficient number of Tier 1 sites exist, then samples must be collected from Tier 2 sites, followed by Tier 3 sites, and finally by representative sites. Samples must be 1- liter in volume and be taken from an interior tap where the water has stood in the pipes for at least six hours. Tap aerators must not be removed prior to sample collection. Systems or residents can collect these samples. (Refer to Appendix E for a copy of Homeowners instructions for sample collection).

The frequency of monitoring and number of samples required is based on population and lead and copper tap 90th percentile results. See Table 3.4 for the number of samples to be collected under standard and reduced monitoring. Systems must conduct monitoring every 6 months unless they qualify for reduced monitoring.

Lead and copper monitoring can be divided into two broad categories:

- **Standard monitoring** includes all monitoring other than reduced monitoring. Standard monitoring

is conducted at 6-month intervals. Both initial monitoring (required of all systems) and follow-up monitoring (corresponds to the two consecutive 6-months after a system completes the installation of corrosion control and is only required for systems that install treatment) are a type of standard monitoring.

Table 3.4 Lead and Copper Tap Monitoring

Size Category	System Size	Number of Lead/Copper Tap Sample Sites[1]	
		Standard	Reduced
Large	> 100K	100	50
	50,001 - 100K	60	30
Medium	10,001 - 50K	60	30
	3,301 - 10K	40	20
Small	501 - 3,300	20	10
	101 - 500	10	5
	≤ 100	5	5

[1] With written DEQ approval, PWSs can collect < 5 samples if all taps used for human consumption are sampled.

- **Reduced monitoring** corresponds to monitoring that occurs at a reduced frequency and number of sample locations. See Table 3.5 for the reduced monitoring criteria.

Table 3.5 Criteria for Reduced Lead and Copper Tap Monitoring

Annual	1. PWS serves ≤ 50,000 people and is ≤ both ALs for 2 consecutive 6-month monitoring periods; or 2. Any PWS that meets optimal WQPs (OWQPs) and is ≤ lead AL for 2 consecutive 6-month monitoring periods.
Triennial	1. PWS serves ≤ 50,000 people and is ≤ both ALs for 2 consecutive years of monitoring; or 2. Any PWS that meets OWQP specifications and is ≤ lead AL for 2 consecutive years of monitoring; or 3. Any PWS with 90th percentile lead and copper levels ≤ 0.005 mg/L and ≤ 0.65 mg/L, respectively, for 2 consecutive 6-month monitoring periods (i.e., accelerated reduced Lead/copper tap monitoring).

Notes:

1. Under the LCR Short Term Revisions (STR), systems can no longer qualify for reduced lead and copper tap monitoring based solely on meeting their OWQPs but also must be at or below the lead action level.

2. Systems that no longer meet the reduced monitoring criteria must return to standard 6-month monitoring.

3.4.2 Monitoring and Compliance Periods

The 2007 LCR STR clarifies the definitions of "monitoring period" and "compliance period".

- **Monitoring period** is the specific period in which water systems must conduct the required monitoring. For systems on a reduced monitoring schedule (i.e., annual, triennial, or nine-year monitoring), the monitoring period is June to September or some other DEQ-designated consecutive four-month period during normal operation when the highest lead levels are likely to occur.
- **Compliance period** is a 3-year calendar period. Systems on triennial monitoring must conduct their monitoring within a four-month consecutive period every 3 years. This prevents the possibility of exceeding more than 3 years between sampling events or spreading sampling out over the 3-year period.

3.4.3 Consumer Notice of Lead Tap Water Monitoring Results

The LCR STR requires all community and non-transient non-community systems to provide individual lead tap results to people who receive water from sites that were sampled, regardless of whether the results exceed the lead AL. The notification must:

- be provided within 30 days of when the system learns of the results.
- include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, steps consumers can take to reduce exposure to lead in drinking water, contact information for the water utility, the maximum contaminant level goal (MCLG) for lead of 0 and the lead AL of 0.015 mg/L, and the following definitions for these two terms:
  - *The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.*
- be mailed or hand delivered for community systems or posted for non-transient non-community systems.

PWSs must provide DEQ with a sample consumer notification and certification of its proper delivery within 3 months after the end of the applicable monitoring period. See Appendix E for a sample letter and certification form.

3.4.4 Consumer Confidence Report (CCR)

The LCR STR requires all community systems to provide a short informational notice in their CCR about lead irrespective of whether the system has detected lead in any of its samples. PWSs must use the mandatory language below unless DEQ has given permission to use alternative language (e.g., change flushing time). Also refer to Section 8 for more detail on CCRs.

> If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The utility is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at *http://www.epa.gov/safewater/lead*.

3.4.5 Action Levels

When the 90th percentile of a system's lead and/or copper tap samples exceeds the ALs outlined in the Table 3.6, PWSs must carry out additional LCR monitoring and and treatment technique requirements. An AL exceedance is not a violation; however, failure to complete any of the follow-up requirements is (See Section 3.4.6 for these requirements.)

Table 3.6 Lead and Copper Action Levels (mg/L)

Lead	0.015 mg/L
Copper	1.3 mg/L

To calculate the 90th percentile level, follow these steps.

If You Collect More than 5 Samples

Step 1: Place *lead* results in ascending order (from lowest to highest value). Step 2: Assign each sample a number, 1 for lowest value.

Step 3: Multiply the total number of samples by 0.9.

Step 4: Compare the 90th percentile level to the AL of 0.015 mg/L (can also be expressed as 15 parts per billion (ppb)). If your 90th percentile value is higher than 0.015 mg/L, you have an exceedance.

Repeat this procedure for copper sample results, except compare the 90th percentile copper level against

its AL of 1.3 mg/L. If your 90th percentile value is greater than 1.3 mg/L, you have an exceedance.

If You Collect 5 Samples

Step 1: Place lead or copper results in ascending order.

Step 2: The average of the 4th and 5th highest sample is your 90th percentile

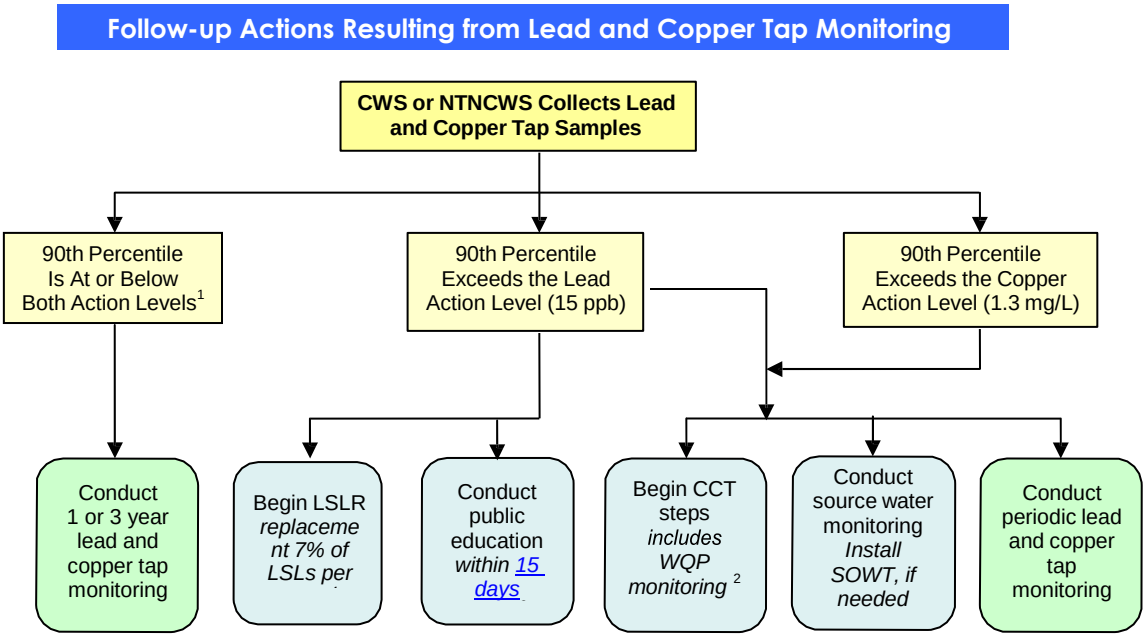
level. Step 3: Compare the 90th percentile level against the lead or copper AL.

If DEQ Allows You to Collect Fewer than 5 Samples

Step 1: Place lead or copper results in ascending order.

Step 2: Compare the highest sample value (this is your 90th percentile level) against the lead or copper AL.

If you serve 50,000 or fewer people and never exceed an AL, you only have to conduct periodic lead and copper tap monitoring. No other monitoring or treatment requirements apply. This is illustrated in Exhibit 4-1 below



[1] Includes systems serving ≤ 50,000 people.
[2] Includes serving more than 50,000 people, irrespective of their 90th percentile levels.
[3] Counted from the end of the monitoring period with the lead ALE.
[4] Required if lead action level is exceeded after treatment.

3.4.6 Treatment Technique Requirements when ALs Are Exceeded

Water quality parameter monitoring

Systems that serve >50,000 people or exceed either AL must collect WQP samples. This monitoring is used to determine water corrosivity, to help DEQ identify the type of OCC to be installed and how it should be operated. Table 3.7 includes the most frequently analyzed WQPs.

Prior to OCC installation, samples are collected at the highest lead or copper exceedance tap and at each entry point to the distribution systems

Table 3.7 Water Quality Parameters

pH[1]	Orthophosphate[2]
Alkalinity	Silica[3]
Calcium	Temperature[1]
Conductivity	

1 Measured on-site.
2 Applies when a phosphate-containing inhibitor is used.
3 Applies when a silicate-containing inhibitor is used.

(EPTDS) during monitoring period(s) in which the AL is exceeded occurred (See Table 3.8 for tap sample number).

After OCC installation, follow-up monitoring is conducted for a minimum of 2 consecutive 6-month periods. After follow-up monitoring, DEQ sets optimal WQP (OWQP) specifications that define OCC. Monitoring continues at a frequency specified by DEQ. Reduced tap WQP monitoring is available for PWSs that operate OCC that meet their OWQP specifications.

Table 3.8 Number of WQP Tap Sample Sites

System Size	Standard	Reduced
> 100K	25	10
100K - 10,001	10	7
3,301 - 10K	3	3
501 - 3,300	2	2
≤500	1	1

Public education

Public education is required if the lead AL is exceeded within fifteen (15) days of DEQ's notification letter. The LCR STR clarifies that delivery of public education materials must be completed within 60 days from the end of the monitoring period in which the lead AL was exceeded and yearly until the AL has been corrected. DEQ requires that public education be completed within fifteen (15) days of the system being notified in writing by DEQ, and yearly until the system has corrected the AL.

There is no education requirement for exceeding copper ALs. Materials distributed to the public will provide the system's customers with information regarding health effects, sources, and what can be done to reduce lead and copper exposure. These materials include; billing inserts sent directly to customers, pamphlets or brochures distributed at health centers. Public service announcements are to be submitted periodically to television and radio stations for water systems >3,300. Templates are also available in the public education guidance documents at http://www.epa.gov/safewater/lcrmr/compliancehelp.html.

Optimal Corrosion control treatment

OCC is required for all systems serving more than 50,000 people regardless of having or having not had AL, and for those serving 50,000 or fewer people that exceed either the lead or copper AL. Systems must recommend OCC within 6 months following the end of the monitoring period where the systems exceed the action level by a Montana certified engineer. A corrosion control study is required for large systems. If DEQ determines a study is required for small or medium systems, it must be completed within 18 months. Once DEQ makes a determination on the type of OCC to be used, the system has 24 months to install the treatment. Systems installing OCC are subject to two, 6-month periods of follow-up monitoring at the minimum. After follow-up monitoring DEQ will determine the system's monitoring status. Small and medium systems with 2 consecutive 6-month monitoring periods without any further lead or copper AL exceedances may discontinue OCC steps, prior to the end of the 24 month installation period.

Source water monitoring and treatment

Within 6 months of exceeding a lead or copper AL all systems are required to collect source water samples

for lead and copper. This monitoring is needed to determine the contribution of lead and copper from the system's source water to its tap water. A source water treatment (SOWT) recommendation must also be made to DEQ within 6 months end of the monitoring period of the exceedance (can include a recommendation that no treatment is needed). If DEQ requires source water treatment, the system will have 24 months to install it. After installing the treatment, systems must collect one sample from every entry point during 2 consecutive 6 month monitoring periods. DEQ will designate maximum permissible levels (MPLs) for lead and copper. These MPLs will be the maximum concentrations of lead and copper allowed into your system after SOWT. Ground water PWSs are required to monitor during 3-year compliance periods; surface water PWSs must monitor annually.

Lead service line replacement (LSLR)/Lead service line monitoring

Systems are required to begin LSLR if they continue to exceed the lead AL after installing OCCT and/or SOWT. At least 7% of a system's lead service lines (LSLs) must be replaced annually. If a sample from a LSL is $\leq$0.015 mg/L, it is considered "replaced through testing" and does not need to be physically removed. If only a portion of the LSL is replaced (e.g., privately-owned portion of the LSL is not replaced), the PWS must: 1) notify customers at least 45 days prior to replacement about the potential for increased lead levels; and 2) collect samples within 72 hours of replacement; 3) notify individuals served by the partially replaced line within 3 days of receipt of the results. A system can discontinue LSLR whenever its lead 90th percentile tap results are at or below the action level for 2 consecutive 6-month monitoring periods. A subsequent lead AL exceedance triggers the system back into LSLR. In addition, the LCR STR require any LSL that was "replaced through testing" to be re-evaluated if the system re-exceeds the lead AL.

The LCR STR clarifies that a system has exceeded an AL during the last day of the monitoring period in which the exceedance occurs (e.g., on September 30). Thus, the deadlines for completing the follow-up activities (described above) are calculated from the end of the monitoring period.

3.4.7 Reporting

All systems must report sampling-related information to DEQ within 10 days of the end of the applicable monitoring period. Thus, for systems on reduced lead and copper monitoring, this information is due to DEQ no later than October 10. Additional reporting requirements regarding LSLR, public education reporting requirements, waivers and the addition of new sources exist. Information on these conditional reporting requirements can be obtained from DEQ or from federal rule language.

The LCR STR also requires water systems to obtain approval from DEQ before implementing any long-term changes in water treatment or adding a new source of water. Notification must occur as early as possible prior to treatment change. Upon approval of the plan, DEQ may require the system to undertake baseline lead and copper monitoring.

3.4.8 Record Keeping

Systems must retain original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, state determinations, and any other information required by the LCR for a minimum of 12 years.

3.4.9 Additional Information

Several guidance documents have been developed to help water systems understand and comply with the requirements of the LCR. Additional information is available at: http://www.epa.gov/safewater/lcrmr/compliancehelp.html, the Safe Drinking Water Hotline at 1-800-426-4791, or from your DEQ representative.

3.5 Secondary Drinking Water Standards

Secondary drinking water standards address contaminants in drinking water that primarily affect the aesthetic qualities relating to the public acceptance of drinking water. Health implications as well as aesthetic degradation may also exist at considerably higher concentrations of these contaminants. The regulations and action levels are not enforceable but are intended as guidelines. The action levels are provided in Table 3.9

below.

DEQ recommends that the secondary contaminants be monitored at the same frequency as the inorganic chemicals contaminants listed in Section 3.2. More frequent monitoring may be appropriate for specific parameters such as pH, color, odor, or others under certain circumstances as directed by DEQ.

Table 3.9 Secondary Maximum Contaminant Levels

Contaminant	Level
Aluminum	.05-.2 mg/l
Chloride	250 mg/l
Color	15 color units
Copper	1.0 mg/l
Corrosivity	Non-corrosive
Fluoride	2.0 mg/l
Foaming agents	.5 mg/l
Iron	.3 mg/l
Manganese	.05 mg/l
Odor	3 threshold odor number
pH	6.5-8.5
Silver	.1 mg/l
Sulfate	250 mg/l
Total dissolved solids	500 mg/l
Zinc	5 mg/l

4. DISINFECTANTS AND DISINFECTION BYPRODUCTS

The Stage 1 and Stage 2 Disinfectants and Disinfection Byproduct Rules (DBPR) regulate the levels and monitoring requirements of disinfectants and disinfection by- products for systems that provide water treated with disinfectants. While disinfectants are effective in controlling harmful microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form DBPs (disinfection byproducts). Specific sample sites and sample points are based on specific DBP studies & historical data.

Systems Affected:

CWSs & NTNCs that provide water that has been chemically disinfected

(Also transient systems that utilize chlorine dioxide)

The state regulations adopting the Stage 2 DBPR can be found in ARM 17.38.216. The federal reference for the Stage 1 DBPR is 40 CFR 141.130-135 and for the Stage 2 DBPR is 40 CFR 141.600- 629.

Table 4.1 Stage 2 DBPR Compliance Dates

Systems that are part of a combined distribution system (purchase from or sell to another system) comply based on the schedule of the largest system in the combined distribution system.

SYSTEM SIZE:	COMPLIANCE DATE[1]
Systems serving 100,000 or more (Schedule 1)	April 1, 2012
Systems serving 50,000-99,999 (Schedule 2)	October 1, 2012
Systems serving 10,000-49,999 (Schedule 3)	October 1, 2012
Systems serving fewer than 10,000 (Schedule 4)	October 1, 2013 or October 1, 2014[2]

[1]DEQ may grant up to an additional 24 months for compliance for systems that require capital improvements.

[2]The later date is for systems required to conduct *Cryptosporidium* monitoring under LT2ESWTR (Long Term 2 Enhanced Surface Water Treatment Rule)

4.1 Disinfectants

4.1.1 Maximum Residual Disinfectant Levels (MRDL)

- The MRDL for Chlorine is 4.0 mg/L as Cl_2
- The MRDL for Chloramines is 4.0 mg/L as Cl_2
- The MRDL for Chlorine Dioxide is 0.8 mg/L

4.1.2 Monitoring Locations and Requirements

Monitoring requirements are based on the type of disinfectant used. There are no provisions for reduced or increased monitoring (other than additional sampling specified for chlorine dioxide systems). Systems that use a combination of disinfectants must sample for each disinfectant used.

Systems that use Chlorine and/or Chloramines

Sample for chlorine and/or chloramines at the same location and frequency as TCR sampling.

Systems that use Chlorine Dioxide

Sample for chlorine dioxide daily at the entrance to the distribution system. If any daily sample exceeds the MRDL, the system must take 3 samples the following day. The location of these additional samples is dependent on disinfection practices of the system. Systems that use chlorine dioxide need to familiarize themselves with these requirements.

4.1.3 Violations

Monitoring Violations

Other than for chlorine dioxide, MRDL monitoring violations require Tier 3 public notice.

MRDL Violations for systems that use Chlorine and Chloramines

Chlorine and chloramine MRDL violations are based on a running annual average (calculate monthly averages and compute compliance quarterly) and require Tier 2 public notice.

Monitoring and MRDL Violations for Systems that use Chlorine Dioxide

The exception to both calculations of MRDL violation as well as public notice requirements for monitoring and MRDL violations is for the systems that use chorine dioxide. Chlorine dioxide MRDL violations can be acute or nonacute. Systems that have an acute chlorine dioxide MDRL violation must provide Tier 1 public notice and take immediate action to lower the level of chlorine dioxide. Systems utilizing chlorine dioxide need to familiarize themselves with the unique requirements for this disinfectant.

4.1.4 Reporting

Systems that use Chlorine or Chloramine

Systems using chlorine or chloramines required to sample quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected. Systems required to sample less frequently must report within 10 days after the end of each monitoring period in which samples were collected.

- Number of samples taken each month of the last quarter
- Monthly average of all samples taken each month
- Average of all monthly samples for last 12 months
- Whether MRDL was exceeded

Systems that use Chlorine Dioxide

Systems using chlorine dioxide required to sample quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected

- Dates, results, locations of samples taken during the last quarter
- Whether MRDL was exceeded
- Whether MRDL was exceeded in any two consecutive daily samples and whether the violation was acute or non-acute

4.2 Disinfection By-Products (DBP)

4.2.1 Maximum Contaminant Level

For systems that use chlorine or chloramines

- The MCL for Total Trihalomethanes (TTHM) is 0.080 mg/L
- The MCL for Five Haloacetic Acids (HAA5) is 0.060 mg/L

For systems that use ozone

- The MCL for bromate (plants that use ozone) 0.010 mg/L

For systems that use chlorine dioxide

- The MCL for chlorite (for plants that use chlorine dioxide) is 1.0 mg/L

4.2.2 Routine Monitoring Locations and Requirements

Monitoring requirements are based on the type of disinfectant used. Systems that use a combination of disinfectants must sample for the DBPs associated with each disinfectant used.

Systems that use Chlorine or chloramines

DBP samples are taken in the distribution system approved sample sites. Samples are dual samples, meaning both TTHM & HAA5 samples are taken at the same location. Sampling Frequency is based on source water & population, see the following table:

Systems that use Ozone

Sample for Bromate monthly at the entry point to the distribution system.

Systems that use Chlorine or Chloramines

Sample for TTHM and HAA5 within the distribution system. The number of sampling sites and sampling frequency is set forth in the following two tables. The first table lists the requirements under Stage 1 DBPR, and the second table lists the new requirements that will go into effect under the Stage 2 DBPR.

The specific site locations are based on the sampling plan prepared in accordance with the Stage 1 DBPR until the Stage 2 DBPR goes into effect, and then the Stage 2 sampling plan will be used.

Under the Stage 2 DBPR, a dual sample set (one TTHM sample and one HAA5 sample) must be taken at each site except as noted in the table below.

Table 4.2 Routine Monitoring Requirements for TTHM and HAA5 under Stage 1 DBPR			
Source Water Type	**Population**	**Monitoring Locations**	**Monitoring Frequency**
Surface and GWUDISW	≥ 10,000	4 per treatment plant	Quarterly
	500-9,999	1 per treatment plant	Quarterly
	< 500	1 per treatment plant	Annually *
Ground water	≥ 10,000	1 per treatment plant	Quarterly
	< 10,000	1 per treatment plant	Annually *
* Sample during month of warmest water temperature. If an MCL is exceeded, increase to quarterly			

Table 4.3 Routine Monitoring Requirements for TTHM and HAA5 under Stage 2 DBPR			
Source Water Type	**Population Size Category**	**Monitoring Locations**	**Monitoring Frequency** [2]
Surface GWUDISW Purchased Surface	<500	2[1]	Annually
	500-3,300	2[1]	Quarterly
	3,301-9,999	2	Quarterly
	10,000-49,999	4	Quarterly
	50,000-249,999	8	Quarterly
	250,000-999,999	12	Quarterly
	1,000,000-4,999,999	16	Quarterly
	> 5,000,000	20	Quarterly
Ground Water	<500	2[1]	Annually
	500-9,999	2[1]	Annually
	10,000-99,999	4	Quarterly
	100,000-499,999	6	Quarterly
	> 500,000	8	Quarterly

[1]These systems may take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. If the highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually) one location with a dual sample set is adequate.

[2]Sampling must include the month of highest DBP concentrations.

4.2.3 Reduced Monitoring

Reduced monitoring requirements for systems using Chlorine Dioxide or Ozone

Systems that use chlorine dioxide can reduce chlorite monitoring in the distribution system from monthly to quarterly if no daily sample has exceeded the MCL, no additional monitoring has been required, and no quarterly sample has exceeded the MCL.

Systems that use ozone can reduce bromate sampling based on bromide source sampling until the Stage 2 rule is in effect when reduced monitoring based on bromate levels is allowed.

Reduced TTHM and HAA5 monitoring requirements under Stage 2 DBPR

Reduced TTHM and HAA5 monitoring must be taken at the sites with highest TTHM and HAA5

samples – divided evenly between the two DBPs. Annual (or less frequent) monitoring must be conducted during the quarter with the highest single DBP values for TTHM and HAA5.

For systems that reduce to two single samples, one dual sample set is adequate if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

Table 4.4 TTHM and HAA5 Reduced Monitoring under Stage 2 DBPR

Source	Population Category	Frequency	Monitoring Locations
Surface GWUDISW / **Purchased Surface**	<500	-	monitoring may not be reduced
	500-3,300	annually	1 TTHM and 1 HAA5
	3,301-9,999	annually	2 dual sample sets
	10,000-49,999	quarterly	2 dual sample sets
	50,000-249,999	quarterly	4 dual sample sets
	250,000-999,999	quarterly	6 dual sample sets
	1,000,000-4,999,999	quarterly	8 dual sample sets
	>=5,000,000	quarterly	10 dual sample sets
Ground Water	<500	every third year	1 TTHM and 1 HAA5 sample
	500-9,999	annually	1 TTHM and 1 HAA5 sample
	10,000-99,999	annually	2 dual sample sets
	100,000-499,999	quarterly	2 dual sample sets
	>=500,000	quarterly	4 dual sample sets

4.2.4 Operational Evaluations

The Stage 2 DBPR will require systems to determine if they have exceeded an Operational Evaluation Level (OEL), which is identified using their compliance monitoring results. After each quarter of sampling, the system will add the values from the previous two quarters to twice the value of the current quarter and divide by four.

$$OEL = \frac{(Q_1 + Q_2 + 2*Q_3)}{4}$$

If this value is greater than the MCL, this is an exceedance of the operational evaluation level. It is not a violation, but an evaluation of what may have caused the high DBP levels is required. This provides an early warning of a possible future MCL violation and allows the system to take **proactive** steps to remain in compliance.

4.2.5 Violations

Monitoring Violations

Monitoring violations for disinfection by-products require Tier 3 public notice.

MCL Violation for systems using chlorine or chlorine dioxide

TTHM and HAA5 MCL violations are based on a system-wide running annual average of quarterly samples. Stage 2 DBPR compliance is based on a "locational running annual average." Compliance will be calculated for each monitoring location in the distribution system. MCL violations for TTHM and HAAS require Tier 2 public notice.

MCL Violations for systems using ozone

Bromate MCL violations are based on a running annual average of monthly samples computed quarterly. MCL violations for bromate require Tier 2 public notice.

MCL Violations for systems using chlorine dioxide

Chlorite MCL violations are based on an average of the three additional samples taken after the daily sample that was over the MRDL. MCL violations for using chlorine dioxide require Tier 2 public notice.

4.2.6 Reporting

Systems required to sample DBPs quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected.

- Number of samples taken during last quarter (or year if on annual)
- Location, date and result of each sample taken during last quarter (or year if on annual)
- Average of all samples taken in last quarter (or year if on annual)
- Annual average of all quarterly averages for last 4 quarters (if on quarterly)
- Whether the MCL was exceeded

Systems required to sample less frequently must report the following within 10 days after the end of each monitoring period in which samples were collected.

- Location, date and result of last sample taken
- Whether the MCL was exceeded

5. FLUORIDE ADDITION

Systems Affected:

Any public system that adds fluoride to their finished water

Some public water systems choose to add fluoride to the drinking water for the dental benefits it can provide. However, high levels of fluoride can have negative public health impacts, causing staining and pitting of teeth.

The levels and monitoring for fluoride added to water is set by state regulation ARM 17.38.230. There is no associated federal regulation.

For naturally occurring fluoride, compliance with the MCL of 4.0 mg/L and the secondary MCL of 2.0 are discussed in Section 3.2.

5.1.1 Maximum Level

Systems that add fluoride to their finished water for the dental benefits must meet the maximum level of 1.5 mg/L in the finished water.

5.1.2 Routine Monitoring

Systems that add fluoride to their water supply shall sample daily and analyze at a point after fluoridation. The sample analysis must use a control range from 0.9 mg/L lower limits to 1.5 mg/L upper limits.

Each month one sample of treated water must be submitted to DEQ laboratory for analysis.

5.1.3 Violations

Failure to sample or submit a sample to DEQ, is considered a Tier 3 violation.

5.1.4 Reporting

The system shall keep records of the analyses on file and forward a copy to DEQ monthly.

6. CONSECUTIVE PUBLIC WATER SYSTEMS

A consecutive system is a public water system that buys or otherwise receives some or all of its finished water from one or more wholesale system(s). Consecutive systems are subject to the same Safe Drinking

Water Act regulations as other public water systems. The regulations that consecutive systems must comply with are system specific and depend on the type of source water.

6.1.1 Monitoring Requirements

Public systems that purchase some of their water but also have their own source are required to comply with the all applicable regulations. However, systems that purchase all of their water and do not have a source of their own are not required to comply with regulations associated with source quality. These systems are only required to comply with the following regulations:

- Revised Total Coliform Rule (see Section 2.1)
- Ground Water Rule – Systems that purchase ground water, must notify the wholesale system in the event of a total coliform positive sample within 24 hours (see Section 2.2.4)
- Disinfectants/Disinfection By-Products Rule – systems that add a chemical disinfectant or provide water that has been disinfected (see Section 4)
- Lead and Copper Rule (see Section 3.4)
- Disinfectant residual monitoring for consecutive connection systems connected to surface water systems or when the department requires the consecutive connection to maintain a residual.
- Surface Water Treatment rule; residual disinfectant monitoring at the entry point and in the distribution system.

6.1.2 Notification Requirements

Consecutive systems are required to follow the Public Notification Rule and Consumer Confidence Rule. Consecutive systems that purchase ground water are required to notify their wholesale system, in addition to public notification requirements, in the event of a total coliform positive sample.

7. PUBLIC NOTIFICATION REQUIREMENTS

Systems Affected:

All public systems

The Public Notification Rule requires systems to notify customers concerning water quality violations or situations. Problems can and do occur within the water system despite the efforts of water suppliers. When a drinking water compliance issue arises, the people who drink the water have a right to know what happened and what they need to do. The public notice requirements of the Safe Drinking Water Act require water suppliers to provide this notice.

Public notification of drinking water violations and other situations provides an opportunity to educate the public, protect public health, build trust with consumers through open and honest sharing of information, and establish an ongoing, positive relationship with your community. The greater the effort your water system makes to reach and inform everyone in your service area, the more they will trust your commitment to delivering safe water and protecting public health.

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.

7.1 What situations require public notice?

In general, public notice is required for any of the following:

- Failure to Monitor
- Exceedances of maximum contaminant levels (MCLs) or maximum residual disinfectant levels (MRDLs);
- Violation of treatment techniques;
- Monitoring and testing procedure violations; and

- Failure to comply with the schedule of a variance or exemption.
- Occurrence of a waterborne disease outbreak or other waterborne emergency;
- Fecal indicator-positive source water samples
- Exceedance of the secondary maximum contaminant level for fluoride;
- Availability of unregulated contaminant monitoring results; and
- Operation under a variance or exemption;
- Special notice for uncorrected significant deficiencies under GWR

7.2 Notification Tiers

7.2.1 Tier 1 Notice – Acute Health Effects

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**. Within 24 hours of learning of the violation or situation, the system must issue public notice and initiate consultation with DEQ.

Microbial

- Acute violation of the MCL for total coliform, or failure to test for E. coli when any sample tests positive for coliform;
- Fecal indicator-positive source sample taken in compliance with the Ground Water Rule
- Violation of the treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit, under the Surface Water Treatment Rules, Interim Enhanced Surface Water Treatment Rule or Long Term 1 Enhanced Surface Water Treatment Rule where DEQ determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;
- Occurrence of a waterborne disease outbreak, as defined in 40 CFR 141.2; and

Chemical and Other

- Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite; or when a confirmation sample is not taken within 24 hours of the system's receipt of the first sample showing exceedance of the nitrate or nitrite MCL;
- Violations of the MRDL for chlorine dioxide when one or more of the samples taken in the distribution system on the day after exceeding the MRDL at the entrance of the distribution system or when required samples are not taken in the distribution system;
- Occurrence of a waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination); and
- Other violations or situations with significant potential for serious adverse effects on human health as a result of short term exposure, as determined by DEQ either in its regulations or on a case-by-case basis.

7.2.2 Tier 2 Notice – Non-acute Health Effects

Tier 2 notices are required for violations and situations with significant potential to have serious adverse effects on human health. The water system must notify its customers as soon as possible but within 30 days of the violation.

- All violations of the MCL, MRDL, and treatment technique requirements except where Tier 1 notice is required;
- Violations of monitoring requirements where DEQ determines that a Tier 2 public notice is required, taking into account potential health impacts and persistence of the violation;

and

- Failure to comply with the terms and conditions of any variance or exemption in place.

7.2.3 Tier 3 Notice – Monitoring Violations and Other Situations

Tier 3 notices are required for all other violations and situations not included in Tier 1 and Tier 2. The system has up to one year to provide a notice to its customers. Community systems may be able to consolidate these notices and send them with their Consumer Confidence Reports (CCR) if the report will be sent within 1 year of the violation or situation.

- Monitoring violations, except where Tier 1 notice is required or DEQ determines that the violation requires a Tier 2 notice;
- Failure to comply with an established testing procedure, except where Tier 1 notice is required or DEQ determines that the violation requires a Tier 2 notice;
- Operation under a variance granted under §1415 or exemption granted under §1416 of the Safe Drinking Water Act;
- Availability of unregulated contaminant monitoring results; and
- Exceedance of the fluoride secondary MCL as required under §141.208.
- Special notices associated with *Cryptosporidium* sampling and failure to report bin classification or mean *Cryptosporidium* level under the LT2ESWTR (Long Term 2 Enhanced Surface Water Treatment Rule)
- Special notice of any uncorrected significant deficiency under the Ground Water Rule (community systems may add to CCR, noncommunity systems must provide special notice within 12 months)

7.3 Timing and Delivery Methods for Public Notification

Table 7.1 Timing and Delivery Methods for Public Notification

Notification Tier	Deadline for Initial Notice	Repeat Notices	Delivery Methods[1]
1	As soon as practical, but no more than 24 hours (DEQ must also be contacted within 24 hours)	As directed by the state	• **All Systems:** • Broadcast media (radio or television), hand delivery, posting[2] or another method approved by DEQ
2	As soon as practical, but no more than 30 days[3]	Every 3 months	**Community:** • Mail or hand delivery • Second delivery method[4]
			NTNC: • Posting, hand delivery, or mail • Second delivery method[4]
3	1 year	Annually	**Community:** • Mail or hand delivery (public notice delivery may be provided by CCR if one year requirement is met.) • Second delivery method[4]

			NCWS: • Posting[2], hand delivery, or mail • Second delivery method[4]

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

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

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

[4]Provide a second delivery method as needed to reach consumers not likely to receive the primary notice.

7.4 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.

7.5 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.

7.6 Required Contents

Public notice of violations and situations must include specific information in order to be considered complete.

7.6.1 10 Required Elements

For each violation and situation requiring notice (other than 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 Chapter 3;
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 inorganic contaminants, 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, 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.

7.6.2 Content of Special Notices

For special notices, the 10 required elements are not necessarily required. The required information associated with these notices is listed below.

Exceedance of the fluoride SMCL

The following language must be included in a special notice for exceedance of the SMLC for fluoride:

> *"This is an alert… This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/l.*
>
> *Dental fluorosis in its moderate or severe forms, may result in a brown staining and or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums.*
> *Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride- containing products. Older children and adults may safely drink the water.*
>
> *Drinking water containing more than 4 mg/l of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/l of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/l because of this cosmetic dental problem.*

Information to alert consumers of the availability of the unregulated contaminant monitoring results

Systems required to conduct unregulated contaminant monitoring must let their customers know that this data is available no later than 12 months from when the data becomes available.

Information about variances and exemptions

If a system has been granted a variance or exemption, the notice must include an explanation of the reasons for the variance or exemption, the date it was issued, a brief status report on the steps the system is taking to address the situation, and a notice of opportunity for public input on the review of the variance or exemption.

Uncorrected significant deficiency underground water rule

If DEQ has identified a significant deficiency at a ground water system and the system has not corrected it within 12 months, the system must provide notice that includes a description of the deficiency, when it was identified by DEQ, the state-approve corrective action, 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.

Monitoring waivers

If DEQ has granted a system any kind of waiver or exemption in monitoring, that system must inform the public it serves within 12 months. It should be included in the annual notice or the CCR as well.

7.6.3 Other Required Standard Language

Health effects language

For MCL and MRDL violations, treatment technique violations, and violations of the conditions of

a variance or exemption, the notice must include language describing health effects associated with the contaminant. For most contaminants, the required language is provided in Appendix C.

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."*

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

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."*

8. CONSUMER CONFIDENCE REPORT

Systems Affected:

Community systems only (excluding water bottlers)

The Consumer Confidence Reports (CCR) Rule requires community systems to provide consumers with an annual water quality report, (NTNC and TNC are not required to comply with CCR rule).The CCR summarizes information regarding sources used (e.g., rivers, lakes, reservoirs, or aquifers), any detected contaminants, and compliance and educational information. This information may help consumers determine if there may be impacts to their health. The 2015 CCR is due to DEQ on June 30, 2015 and includes sample results from January1 – December 31, 2014

EPA published the final Consumer Confidence Report (CCR) Rule in 1998. The State adopted the federal regulations by reference under ARM 17.38.239. The federal reference is 40 CFR 141.151-155.

8.1 Delivery Requirements

The following is a list of distribution requirements:

Systems serving 10,000 or more people:

- Mail a copy of the report to each customer
- Make a good faith effort to reach those customers who don't get water bills, such as renters. This may include:
    - Posting on internet
    - Advertising availability in the newspaper
    - Publishing in the local newspaper

    - Posting in a public place
    - Delivering multiple copies to single bill addresses that have several people (e.g., apartment complex, etc.)
    - Delivering to community organizations
- Provide a copy of the CCR to anyone who requests one or is identified by DEQ.
- Systems serving over 100,000 must post their CCR on the

internet. Systems serving between 500 and 10,000 people:

- Publish the report in at least one local newspaper
- Notify their customers where they can get a copy
- Provide copies to anyone who requests

one. Systems serving less than 500 people:

- Provide notice by mail, door-to-door delivery, or by posting in an appropriate location that the report is available upon request
- Provide copies to anyone who requests it.

8.2 Report Contents

Table 8.1 Contents of the Report
Water System Information • Name/phone number of contact person • Information on public participation opportunities • Information for non-English speaking populations; if applicable
Sources of Water • Type and name of water sources (ex. Ground water, Clarks Fork valley aquifer) • Availability of source water assessments • Information on significant sources of contamination, if available
Definitions: MCL, MCLG, and, if applicable, Treatment Technique (TT), Action Level, MRDLG, MRDL, Variances and/or Exemptions, RTCR Assessments

Detected Contaminants (Main Contaminant Table) - Summarize data on detected contaminants.

- For regulated contaminants include MCLs, MCLGs, TT, action level or MRDL and list the year the sample was taken (if other than current year)
- Range of levels found
- Known or likely source of each detected contaminant
- Highest contaminant levels used to report compliance (except for turbidity and total coliforms):
    - Annually or less frequent monitoring - use highest value and note that results are from most recent required sample.
    - Running system average - use average value
    - Running locational average - use highest location
- For turbidity
    - Systems that filter report the highest single measurement and lowest monthly percentage of samples meeting the combined filter effluent limit.
    - Systems that do not filter report the highest monthly value.
- For RTCR
    - Highest number of monthly positive total coliform samples if system takes less than 40 samples per month.
    - Highest percent of monthly positive total coliform samples if system takes 40 or more samples per month.
    - The number of fecal positive samples during the year.
    - For lead and copper, report most recent 90th percentile **and** the number of samples that exceeded the action level.
- For MCL, MRDL, or TT violations include health effects language, an explanation of the violation, length of the violation, and actions taken by the system toward correcting the violation
- Information on *Cryptosporidium*, radon, and detected but unregulated contaminants that may be considered potentially harmful, if applicable

Table 8.1 Contents of the Report (Continued)

Other Information to include in the report

- Report all other violations of the National Primary Drinking Water Regulations occurring during the year covered by the report and include an explanation of the violation, any potential adverse health effects and the steps the system has taken to correct the violation
- Explanation of contaminants that are reasonably expected to be found in the drinking water
- Warning for vulnerable populations that includes information about *Cryptosporidium*
- Informational statement for lead – required for all systems regardless of monitoring results.
- Informational statement for arsenic if levels were greater than 5 ppb but less than or equal to 10 ppb.
- Informational statement for nitrate if levels were greater than 5 ppm but less than 10 ppm.
- For any fecal indicator-positive source sample taken in compliance with the Ground water Rule, special notice in the report must include the source of contamination (if known), the date of the samples, whether the contamination has been addressed and the potential health effects language specified in the rule.
- If DEQ has identified a significant deficiency and the system has not corrected it by the end of that calendar year, the system must provide notice that includes a description of the deficiency, when it was identified by DEQ, the state-approve corrective action, the schedule for corrective action.

8.3 Deadlines

The following table provides information pertaining to the dates in which the report or information pertaining to the report are due. Community PWS must provide DEQ with a copy of the CCR along with a completed CCR Certification Form. The CCR Certification Form certifies that the CCR has been distributed to customers in manner indicated.

Table 8.2 Report Deadlines	
ANNUAL DUE DATE	**REQUIREMENT**
March 30	Deadline for community systems that sell water to another community system to deliver the information necessary for the purchasing system to prepare their CCR.
June 30	Deadline for annual distribution of CCR to customers and to DEQ for the previous calendar year.
Sept 30	Deadline for annual submissions of proof of distribution, submittal of CCR Certification Form to DEQ.

More detailed information about this rule can be obtained either by viewing the EPA website at www.epa.gob/safewater/ccr1.html or by contacting the DEQ Consumer Confidence Report Rule manager at 444-4400.

CCRiWriter

EPA has created a web based tool to help water systems create their annual CCRs by answering required questions and filling in blanks. The CCRiWriter is free and available at: http://ccriwriter.com

9. OTHER

9.1 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 reference 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. Some of these requirements may not apply if your system purchases its drinking water and adds no additional treatment.

Table 9.1 Recordkeeping for Public Water Systems	
Records	**Timeframe**
- Corrective Action for Violations - Public Notices - Consumer Confidence Reports (Community systems only)	At least 3 years
- Microbiological analyses - Turbidity analyses -Variances or exemptions	At least 5 years

-Chemical analyses -Sanitary surveys and written reports -Stage 1 and Stage 2 monitoring plans	At least 10 years
-Records of all lead and copper results, WQP results, source water sampling results, corrosion control recommendations and studies, public education materials, state determinations, schedules, letters, evaluations	At least 12 years

9.2 Sanitary Surveys

The state is required to conduct sanitary surveys of public water systems 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. Community systems are visited every 3 years and non-community systems are visited on a 5-year schedule. 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 by 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 notice. Non-Community systems must provide the special notice annually. Community systems can incorporate the notice in their consumer confidence report.

9.3 Operator Certification

State regulation ARM 37.42.101 requires that persons responsible for the operation and maintenance of a community public water system become certified (licensed) as a system operator. To become a licensed operator, a person must:

- Submit an application at least 30 days prior to taking the exam,
- Pay the appropriate fees,
  $70 for Water Distribution and/or Water Treatment (annual-non refundable)
  $70 for Each Exam (4AB considered one exam)
- Satisfactorily complete an examination concerning water system principles and practices, and
- Fulfill the necessary education/experiences requirement for the appropriate certification class.

9.3.1 Certification Classes

There are two types of water system operator certifications in the State of Montana: Distribution System and Treatment. Distribution system certifications are classified by population served. Treatment certifications are classified by the complexity of treatment system and the population served. The following table summarizes

the certification classes and the experience requirement for each class.

Table 9.2 Certification Classes

	I First Class	II Second Class	III Third Class	IV Fourth Class
A. Water Distribution Operator[1]	Serving more than 15,000 people	Serving 1,501-15,000 people	Serving 500-1,500 people	Serving fewer than 500 people
B. Water System Operator [1]	Treatment for surface water utilizing chemical coagulation, filtration, and disinfection	Treatment for surface water not utilizing chemical coagulation	Groundwater supply serving at least 500 people, with or without disinfection	Groundwater supply serving fewer than 500 people, with or without disinfection
Experience Requirement for Fully Certified Operator	30 months	24 months	18 months	12 months

[1]When an accurate population census is not available, the population served may be determined by multiplying the number of service connections by 2.5.

9.3.2 Operator Responsibilities

The operator's responsibility is to assure drinking water is in adequate supply and that it is safe for the public to consume by complying with DEQ's drinking water regulations. At the same time, the operator is responsible for assuring wastewater discharges does not endanger state waters. There are numerous activities that go along with these responsibilities.

Here is a list of some of those responsibilities:

- Sampling and/or monitoring to meet requirements.
- Keeping monitoring and other records
- Being readily available to:
    - act on sampling, monitoring and reporting to regulatory agencies;
    - respond to system inspections, system users or DEQ personnel;
    - react to system malfunctions.
- Issuing notice to users when the systems are not in compliance and there is a health risk.
- Protecting, maintaining and/or operating equipment purchased at public or user expense to provide safe drinking water in adequate supply or process safe effluent.
- Keeping records on the system maintenance program
- Calculating and making chemical applications or removals in order to protect public health or state waters or parts of the system.
- Understanding and preventing what may endanger a safe drinking water supply or wastewater effluent or equipment used to do the same.
- Assuring that newly installed or repaired equipment or systems meet requirements adopted to protect the public health and environment.
- Notifying the DEQ of the termination of your responsibilities to a system and advising your replacement that he/she requires certification.

9.3.3 Certification Renewal

Operators must renew their certification annually (by June 30) for the following fiscal year (July 1-June 30). Renewal includes a fee payment annually and proof of completion of the appropriate continuing education credits (CEC) requirements every two years (on even numbered years).

9.3.4 CEC Requirement for Certified Operators:

Fully Certified Operators:

Class 1 operators:	2.0	CECs	(20	hours)	per certification
Class 2, 3 or 4 operators:	1.0	CECs	(10	hours)	per certification
Class 5 operators:	0.4	CECs	(4	hours)	per certification

Certified Operators-in-Training:

Class 1 operators:	1.0	CECs	(10	hours)	per certification
Class 2, 3 or 4 operators:	0.50	CECs	(5	hours)	per certification

For more information regarding these requirements, please contact the Certification Office at 406-444-3434, 406-444-4584 or visit the website at http://www.deq.mt.gov/wqinfo/opcert

9.4 Water System Improvements

In accordance with ARM 17.38.101, the construction, alteration, extension or operation of a public water system must be approved by DEQ. Design of a community public water supply system must be prepared and designed by a licensed professional engineer in accordance with DEQ-1. Design of a non-transient non-community system must be in accordance with DEQ-3, and requires a licensed professional engineer when the complexity of the system warrants this level of expertise.

All plans and specifications for such improvements must be reviewed and approved by the DEQ Public Water Supply Section prior to construction. The design of a new community water systems requires the applicant to address technical, managerial, operational, maintenance and financial capacity in accordance with Appendix A in DEQ-1.

Any new ground water source must be evaluated for ground water under the direct influence of surface water (PWS-5). All new sources must be properly assessed and located in accordance with PWS-6.

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

9.5 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.

The annual fee for community water systems is based on the number of service connections. Each water system shall determine the total number of active service connections for each fiscal year based on an assessment that occurs between July 1 and August 1 of that fiscal year. For the purpose of calculating the fee, a service connection has the following requirements

- the connection was turned on for some portion of the fiscal year
- payment is required for the water services
- the connection supplies water for human consumption (not exclusively for livestock or fire protection)

APPENDIX A – REVISED TOTAL COLIFORM SAMPLE SITE PLAN GUIDELINES

A coliform sample site plan must be prepared by the owner or designated operator and sampled in accordance with the Revised Total Coliform Rule. To ensure samples are representative, routine sample sites should 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, and 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.

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.
- 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 owner's name, business name, and street address where available, for each routine sample site.

Table A-1 Minimum Routine Sample Sites

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

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 should 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:

- Inspect the plumbing to ensure there are no cross-connections with non-potable water sources
- Make sure the sampling tap is free of any aerators, strainers, hoses, or water treatment devices.
- Avoid leaking taps that allow water to flow to the outside of the tap.
- Routine sample sites shall 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.
- 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. Proper sample collection is important to ensure bacteria does 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
    - Adjust the flow to 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
    - Keep the inside of the cap pointed down
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.

APPENDIX C - MAXIMUM CONTAMINANT LEVELS AND HEALTH EFFECTS LANGUAGE

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Microbiological contaminants:			
Total Coliform Bacteria	MCL: (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 2 positive monthly sample; failure to take all repeat samples	Naturally present in the environment	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.

Fecal coliform and E. coli	0	Human and animal fecal waste	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.
Fecal Indicators (enterococci or coliphage)	TT	Human and animal fecal waste	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.
Total organic carbon (ppm)	TT	Naturally present in the environment	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	TT	Soil runoff	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Beta/photon emitters (mrem/yr)	4 mrem/yr	Decay of natural and man-made deposits	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters (pCi/L)	15 pCi/L	Erosion of natural deposits	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Combined radium (pCi/L)	5 pCi/L	Erosion of natural deposits	Some people who drink water containing radium-226 or -228 in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium (pCi/L)	30 µg/L	Erosion of natural deposits	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Antimony (ppb)	.006	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
Arsenic (ppb)	[1]0.010	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos (MFL)	7 MFL	Decay of asbestos cement water mains; Erosion of natural deposits	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium (ppm)	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	.004	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions
Bromate (ppb)	.010	By-product of drinkig water disinfection	Some people who drink water of containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium (ppb)	.005	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chloramines (ppm)	MRDL=4	Water additive used to control microbes	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine (ppm)	MRDL=4	Water additive used to control microbes	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Chlorine dioxide (ppb)	MRDL=.8	Water additive used to control micorbes	Some infants and young children who drink water chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chlorite (ppm)	1	By-product of drinking water disinfection	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chromium (ppb)	.1	Discharge from steel and pulp mills; Erosion of natural deposits	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper (ppm)	AL=1.3	Corrosion of household plumbing systems; Erosion of natural deposits	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.
Cyanide (ppb)	.2	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride (ppm)	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Lead (ppb)	AL=.015	Corrosion of household plumbing systems; Erosion of natural deposits	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury [inorganic] (ppb)	.002	Erosion of natural deposits; Dis charge from refineries and factories; Runoff from landfills; Runoff from cropland	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (ppm)	10	Runoff from fertilizer use; Leaching from septic tanks, sew age; Erosion of natural deposits	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite (ppm)	1	Runoff from fertilizer use; Leaching from septic tanks, sew age; Erosion of natural deposits	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.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Selenium (ppb)	.05	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium (ppb)	.002	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
2,4-D (ppb)	.07	Runoff from herbicide used on row crops	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP [Silvex](ppb)	.05	Residue of banned herbicide	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	TT	Added to water during sewage/wastewater treatment	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Alachlor (ppb)	.002	Runoff from herbicide used on row crops	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine (ppb)	.003	Runoff from herbicide used on row crops	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene [PAH] (nanograms/l)	.0002	Leaching from linings of water storage tanks and distribution lines	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran (ppb)	.04	Leaching of soil fumigant used on rice and alfalfa	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane (ppb)	.002	Residue of banned termiticide	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon (ppb)	.2	Runoff from herbicide used on rights of way	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl) adipate (ppb)	.4	Discharge from chemical factories	Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Di(2-ethylhexyl) phthalate (ppb)	.006	Discharge from rubber and chemical factories	Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloropropane (ppt)	.0002	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb (ppb)	.007	Runoff from herbicide used on soybeans and vegetables	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat (ppb)	.02	Runoff from herbicide use	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin [2,3,7,8-TCDD] (ppq)	.00000003	Emissions from waste incineration and other combustion; Discharge from chemical factories	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Endothall (ppb)	.1	Runoff from herbicide use	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin (ppb)	.002	Residue of banned insecticide	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Epichlorohydrin	TT	Discharge from industrial chemical factories; An impurity of some water treatment chemicals	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide (ppt)	.00005	Discharge from petroleum refineries	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate (ppb)	.7	Runoff from herbicide use	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor (ppt)	.0004	Residue of banned pesticide	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide (ppt)	.0002	Breakdown of heptachlor	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
Hexachlorobenzene (ppb)	.001	Discharge from metal refineries and agricultural chemical factories	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
Hexachlorocyclopentadiene (ppb)	.05	Discharge from chemical factories	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane (ppt)	.0002	Runoff/leaching from insecticide used on cattle, lumber, gardens	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor (ppb)	.04	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl [Vydate] (ppb)	.2	Runoff/leaching from insecticide used on apples, potatoes and tomatoes	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
PCBs [Polychlorinated biphenyls] (ppt)	.0005	Runoff from landfills; Discharge of waste chemicals	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Pentachlorophenol (ppb)	.001	Discharge from wood preserving factories	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram (ppb)	.5	Herbicide runoff	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Simazine (ppb)	.004	Herbicide runoff	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene (ppb)	.003	Runoff/leaching from insecticide used on cotton and cattle	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Benzene (ppb)	.005	Discharge from factories; Leaching from gas storage tanks and landfills	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride (ppb)	.005	Discharge from chemical plants and other industrial activities	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (ppb)	.1	Discharge from chemical and agricultural chemical factories	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene (ppb)	.6	Discharge from industrial chemical factories	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
p-Dichlorobenzene (ppb)	.075	Discharge from industrial chemical factories	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane (ppb)	.005	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,1-Dichloroethylene (ppb)	.007	Discharge from industrial chemical factories	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene (ppb)	.07	Discharge from industrial chemical factories	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene (ppb)	.1	Discharge from industrial chemical factories	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane (ppb)	.005	Discharge from pharmaceutical and chemical factories	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-Dichloropropane (ppb)	.005	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene (ppb)	.7	Discharge from petroleum refineries	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (HAA) (ppb)	.060	By-product of drinking water disinfection	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene (ppb)	.1	Discharge from rubber and plastic factories; Leaching from landfills	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloroethylene (ppb)	.005	Discharge from factories and dry cleaners	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
1,2,4-Trichlorobenzene (ppb)	.07	Discharge from textile-finishing factories	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane (ppb)	.2	Discharge from metal degreasing sites and other factories	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
1,1,2-Trichloroethane (ppb)	.005	Discharge from industrial chemical factories	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
Trichloroethylene (ppb)	.005	Discharge from metal degreasing sites and other factories	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

Contaminant (units)	Traditional MCL in mg/L	Major sources in drinking water	Health effects language
TTHMs [Total trihalomethanes] (ppb)	0.10/.080	By-product of drinking water disinfection	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Toluene (ppm)	1	Discharge from petroleum factories	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
Vinyl Chloride (ppb)	.002	Leaching from PVC piping; Discharge from plastics factories	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (ppm)	10	Discharge from petroleum factories; Discharge from chemical factories	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

[1]These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

Key
AL=Action Level
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
MFL=million fibers per liter
MRDL=Maximum Residual Disinfectant Level
MRDLG=Maximum Residual Disinfectant Level Goal
mrem/year=millirems per year (a measure of radiation absorbed by the body)
N/A=Not Applicable
NTU=Nephelometric Turbidity Units (a measure of water clarity)
pCi/l=picocuries per liter (a measure of radioactivity)
ppm=parts per million, or milligrams per liter (mg/l)
ppb=parts per billion, or micrograms per liter (µg/l)
ppt=parts per trillion, or nanograms per liter
ppq=parts per quadrillion, or picograms per liter
TT=Treatment Technique