

Safe Drinking Water Act & State Regulations



New Mexico Rural Water Association
3413 Carlisle Blvd NW
Albuquerque, New Mexico 87110
505-884-1031

**What is the main, most important reason for
having a trained, certified water system
operator?**

PROTECT PUBLIC HEALTH

Federal Safe Drinking Water Act (SDWA)

§ Enacted in 1974 by congress.

§ Became effective in 1976.

§ Amended in 1986 and 1996.

§ Purpose:

1. Establish national health-based enforceable standards.
2. Require monitoring, reporting and record keeping.
3. Establish the minimum treatment requirements.

Safe Drinking Water Act (SDWA)

- 1974:** Environmental Protection Agency (EPA) was mandated to identify the constituents in drinking water that cause adverse health affects.
- 1977:** National interim primary drinking water regulations were established.
- 1979:** TTHM's (trihalomethanes) started being regulated
Trihalomethanes are organic compounds that are formed during the disinfection process and are considered to be carcinogens.
- 1986:** EPA was mandated to specifically regulate microbiological constituents, inorganic and organic compounds and radioactivity.

Safe Drinking Water Act (SDWA)

1996: More amendments were established that looked at preventative approaches to safe drinking water, improve consumer education (CCRs) and funding for States and local water systems.

Congress intended that the SDWA would be a partnership between States, the USEPA, and local water utilities.

New Mexico, by accepting primary enforcement responsibility (primacy) implements the law within the State. Water utilities have to meet the requirements of the law, thereby providing the day-to-day surveillance of the water supplies.

Federal Safe Drinking Water Act (SDWA)

- § Each state (except Wyoming and District of Columbia) and Tribal government has primacy, i.e has responsibility to enforce the SDWA.

- § Drinking Water Bureau (DWB) of the New Mexico Environment Dept. is the enforcement agency for NM.

- § NMED, P.O. Box 26110, Santa Fe, NM 87502. (505) 476-8625 or (877) 827-7545

- § DWB web site: <http://www.nmenv.state.nm.us>

References

<http://www.epa.gov/safewater/publicoutreach/quickreferenceguides.html>

USEPA Safewater Quick Reference Guides

<http://www.nmenv.state.nm.us>

NM Environment Department Home Page

<http://www.nmenv.state.nm.us/dwb>

NMED-Drinking Water Bureau Home Page

<http://eidea-t.nmenv.state.nm.us/SDWIS>

**NMED-DWB State Drinking Water Information System
database**

**For more information on the SDWA or the Rules,
contact your NMED-DWB District or Field Office**

Albuquerque District Office – (505) 222-9500

Farmington Field Office:(505) 327-771

Santa Fe District Office – (505) 476-8600

Espanola Field Office (505) 753-7256

Raton Field Office (575) 445-3621

Clovis District Office – (505) 762-3728

Ruidoso Field Office (575) 258-3272

Hobbs Field Office (575) 393-4302

Las Cruces District Office – (575) 524-6300

Silver City Field Office(575) 388-1934

Public Water Systems

- § A system for the provision to the public of water for human consumption, through pipes or other constructed conveyances.
- § Any system that contains 15 service connections or serves 25 people more than 60 days a year.
- § Can include private schools, interstate rest stops, state parks, and even restaurants.
- § Responsible for both complying with drinking water regulation and reporting to the public when any standards are exceeded.



Water System Size and Classification

- § Very small system < 500 population
- § Small system < 3,300 population
- § Medium system < 50,000 population
- § Large system \geq 50,000 population

Community Water System

§ A Community Water System meets the following:

- At least 15 Service Connections
- Used by year-round residents
- Or regularly serves at least 25 year-round residents

§ Approximately 650 in New Mexico

§ Types of CWS:

- MDWCA
- Water and Sanitation District
- Water Users Association
- Municipal
- Private (for profit)



Municipalities

Mobile Home Parks



Non-Community Water System

§ Not a community water system

§ 2 classes of NCWS:

1. Transient non-community water system (TNC)
2. Non-transient non-community water system (NTNC)

Non-Transient Non-Community Water Systems

§ A non-community water system that regularly serves:

1. 25 of the same persons
2. Over 6 month per year

§ Examples:

1. Schools
2. Factories
3. Industrial Parks
4. Office Buildings

Transient non-community Water System

§ A non-community water system that does not regularly serve:

1. At least 25 of the same persons
2. Over a 6 month period per year

§ Examples:

1. Highway Rest Stops
2. Restaurants
3. Motels
4. Golf Courses
5. Parks with their own water supply

New Mexico Drinking Water Regulations

- § Latest version effective July 2007 available for download from www.nmenv.state.nm.us and follow link for Drinking Water, Laws & Regulations
- § NMAC Title 20, Chapter 7, Part 10 – 20.7.10
- § In addition to SDWA regulations
- § 9 pages long
- § Covers the following:
 - Adoption of Federal regulations
 - Water system project requirements
 - Operating requirements
 - Inspections
 - Public notification

Public Water System Projects

- A. Except as provided in Subsection B, no person shall undertake a public water system project without first obtaining written approval from NMED.
- B. The following public water system projects do not require approval from NMED:
 - 1) A modification that involves the replacement or construction of less 1,000 feet of distribution piping and appurtenances during any 60 calendar day period; or
 - 2) A modification that involves the replacement or construction of only distribution facilities for which the public water system employs a water utility staff that includes, either by contract or direct employment, a professional engineer registered in New Mexico who is responsible for the project.

Compliance & Emergency Powers

- 1) The secretary (i.e. NMED) may take any action necessary to protect the health of persons who are or may be served by a public water system, including but not limited to issuing orders, assessing penalties or commencing a civil action for appropriate relief:
 - (a) if the public water system fails to meet any requirement of this Part;
 - (b) upon receiving information that a contaminant ... is present in or likely to enter the public water system, that the presence of such contaminant may present an imminent and substantial endangerment to the health of persons served by the system, and that appropriate local authorities have not acted to protect the health of such persons; or

Compliance & Emergency Powers

- (c) in response to a civil emergency involving public drinking water. The secretary's response shall be coordinated, when appropriate, with other state emergency response and relief efforts.
- 2) If the secretary determines that treatment of water is necessary for a public water system to meet the maximum contaminant levels set forth at 40 CFR sections 141.11-141.16 and 141.61-141.66, such treatment shall be continuously maintained until the public water system can demonstrate to the secretary that such treatment is no longer necessary.

General Operating Requirements (Abbreviated) – 20.7.10.400.A-M

- A. Prevent water in a system from being contaminated while performing maintenance or replacement of equipment.
- B. Security and protection of water system, to prevent unauthorized entry to and contamination of the water supply.
- C. Protection of public water system from entry of non-potable fluids, foreign materials and critters .
- D. Protection of finished water storage facilities from flooding, infiltration, insects, and vermin.
- E. Immediate notification of NMED if there is contamination of or unauthorized entry to the system.
- F. Disinfection following the completion of a public water system project not requiring NMED approval.

General Operating Requirements (cont'd)

- G. Disinfection following construction, modification or repairs not requiring NMED approval.
- H. Disinfection and system flushing of seasonally operated facilities. Special sampling for bacterial contaminants.
- I. Maintenance and disinfection of water storage facilities.
- J. Prohibition of Iodine as a disinfection.
- K. Direct and indirect additives that may come into contact with water supply must certified by the American National Standards Institute & National Sanitation Foundation prior to use or application (NSF/ANSI 60 & 61)
- L. Cross-connection to a public water system or within a public water system shall be prohibited, unless the public water system is protected by a device or method acceptable to the NMED to prevent the back flow of water.

Who Is Responsible For Sampling?

- The system is responsible for sampling required under the Total Coliform Rule (TCR). The system is responsible for collecting TCR samples in a proper and timely manor and ensuring that they are delivered to a certified lab. The system is also responsible for sampling under the Lead & Copper Rule.
- NMED collects and delivers to a lab all samples required under the other SDWA rules. The system is responsible for samples not collected by DWB.

Who Is Responsible For Sampling?

- It is the responsibility of the system to provide safe and accessible sampling sites. Sampling sites should be clean, free from any hazards (such as poisonous insects, snakes or rodents), located in an area that is easily accessed and do not require confined space entry.
- All laboratory costs are paid for by NMED. The money for these costs is provided for by the Water Conservation Fund, as authorized by the NM Legislature.

The Water Conservation Fee

- The Water Conservation Fund is funded by the Water Conservation Fee. This fee is imposed on every public water supply system in an amount equal to three cents (\$.03) per thousand gallons of water produced.
- In addition to sampling, the fund may be used to: perform vulnerability assessments which will be used to assess a public water supply's susceptibility to contaminants; and implement new requirements of the Utility Operators Certification Act [Chapter 61, Article 33 NMSA 1978] and provide training for all public water supply operators.
- The fee shall be paid to the Taxation and Revenue Department by each person who operates a public water supply system in the manner required by the department on or before the twenty-fifth day of the month following the month in which the water is produced.

NOTE that perennially, some systems statewide are late in paying their portion of the conservation fee, or have never registered, which puts financial burden on the state budget to get samples collected & analyzed.

SDWA Regulations

§ Under the SDWA, many important rules were promulgated including:

1. Total Coliform Rule (TCR)
2. Phases I, II & V (VOCs, IOCs and SOCs)
3. Radionuclide Rule
4. Lead & Copper Rule (LCR)
5. Surface Water Treatment Rules
6. Disinfection Byproducts Rule
7. Consumer Confidence Rule

SDWA Rules

Each rule establishes most or all of the following:

- **Maximum Contaminant Levels (MCL)** - The highest level of contaminant that is allowed in water which is delivered to any user of a public water system. Review EPA insert.
- **Maximum Contaminate Level Goals (MCLG)** - 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.
- **Monitoring and Analytical Requirements** – What to sample for, how often to collect samples, how many samples to collect, where to collect them, how the labs must analyze them.
- **Reporting and Recordkeeping Requirements** – What to report to the primacy agency and customers, when to report it, what records to maintain, how long to maintain them.

Maximum Contaminant Level (MCL)

The maximum permissible amount of a contaminant in water delivered to a user of a public water system.

CONTAMINANTS

- **PRIMARY STANDARDS**
 - **Known health effects**

- **SECONDARY STANDARDS**
 - **Associated impacts that are not directly related to health, such as taste and staining.**

PRIMARY CONTAMINANTS

- **Inorganics**
- **Organics (pesticides)**
- **VOC's**
- **TTHM's**
- **Turbidity**
- **Radioactive**
- **Total coliform bacteria**

SECONDARY CONTAMINANTS

- **Iron**
- **Hardness**
- **Manganese**
- **pH**
- **Aluminum**
- **Copper**
- **Fluoride (2.0 mg/L, 4.0 mg/L)**

The Total Coliform Rule (TCR)

- Purpose: To improve public health protection by reducing fecal pathogens to minimal levels through control of total coliform bacteria, including fecal coliforms and *Escherichia coli* (*E. coli*).
- The TCR sets the MCL for coliform bacteria in drinking water.
- The TCR requires regular collection of drinking water samples to be analyzed by a certified lab.
- The TCR applies to all public water systems
- The TCR has resulted in reduction in risk of illness from disease causing organisms associated with sewage or animal wastes.

Phase I, II, IIb & V Rules

- These 4 rules, issued between 1987 and 1992, regulate 69 different contaminants in drinking water.
- The regulated contaminants include Volatile Organic Contaminants (VOC), Synthetic Organic Contaminants (SOC) and Inorganic Contaminants (IOC). The contaminants regulated in these rules pose long-term, or chronic, health risks. Several are carcinogens.
- Nitrate requirements affect all PWS. All other contaminants affect CWS and NTNCs only.
- VOC, SOC and IOC records must be kept for 10 years.
- Samples collected by DWB at entry points to distribution system representative of each source after treatment.

Phase I, II, IIb & V Rules

Inorganic Contaminants (IOC):

- IOCs include nitrate, fluoride and asbestos.
- Nitrate poses an immediate health risk to pregnant women and infants.
- Sample at entry points to distribution system or at the well after treatment.
- Nitrate & Nitrite sampled annually (unless nitrate $> \frac{1}{2}$ MCL in which case quarterly).
- Asbestos sample every 9 years.
- All other sample types: groundwater every 3 years, surface water annually.

Phase I, II, IIb & V Rules

Volatile Organic Contaminants (VOC):

- VOCs include Industrials solvents such as trichloroethylene (TCE) and perchloroethylene (PCE) and gasoline constituents such as benzene and toluene. Most are carcinogenic.
- Sample annually. After three consecutive annual samples with no detections, can reduce sampling frequency. If VOCs detected, must return to annual sampling.

Phase I, II, IIb & V Rules

Synthetic Organic Contaminants (SOC):

- SOCs include pesticides such as 2,4-d, dioxin and chlordane as well as other industrial semi-volatile organic chemicals such as PCBs.
- If system population is $> 3,300$, sample 2 times each 3 year compliance period while SOCs not detected. If population $\leq 3,000$ sample one time each 3 year compliance period if SOCs not detected.
- If SOCs detected, sample annually or quarterly depending on concentrations.

Radionuclide Rule

- Radionuclide rules published in 1976 and 2000. Applies to all CWS and NTNCs.
- Regulates Radium (Ra-226 and Ra-228), beta emitters, gross alpha particles and uranium (U-234, U235 and U-238).
- MCL for Radium Ra-226 + Ra-228 = 5 pCi/L
MCL for Beta/photon emitters 4 mrem/year
MCL for Gross alpha particles 15 pCi/L.
MCL for Uranium is 30 ug/L
- Monitoring requirements:
 - Initial sampling quarterly for one year.
 - May then reduce sampling frequency if average is below MCL.

Arsenic Rule

- Arsenic Rule published in 2001. Applies to all CWS and NTNCs.
- MCL changes from 50 ug/L to 10ug/L beginning January 23, 2006. There are ~90 systems in New Mexico impacted by this new standard.
- Monitoring requirements:
 - Sample once every 3 years for groundwater, annually for surface water.
 - If sample exceeds MCL, sampling must be done quarterly until systems are reliably and consistently below MCL.
- Samples collected by DWB

Lead & Copper Rule

- Lead & Copper Rule published in 1991 and revised in 2000. Applies to all CWS and NTNCs.
- Action levels are 0.015 mg/L lead and 1.3 mg/L copper.
- Monitoring requirements:
 - Samples collected from residence taps.
 - Samples collected every 6 months unless qualify for reduced monitoring.
 - Number of samples collected depends on population served.
- Action levels exceeded by more than 10% of samples collected results in public notification & education, possible corrosion control.
- Samples collected by the water system.

Stage 1 Disinfection Byproducts Rule

- Surface water systems are more likely to have problems with DBPs.
- Monitoring requirements:
 - Surface water and GWUDI systems collect more frequent samples.
 - Number of samples collected depends on population served.
 - Reduced sampling possible if sufficiently low results.
 - Disinfectant residuals at same location and frequency as TCR.
- Samples collected by the DWB.

Stage 1 Disinfection Byproducts Rule

- Stage 1 DBPR published in 1998. Impacts all CWS and NTNCWS that add a disinfectant and TNCWS that add chlorine dioxide.
- Chlorine can react with organic matter in water to create byproducts that are harmful. The two classes of DBPs are Trihalomethanes and Haloacetic Acids. MCLs are 0.08 mg/L for Total Trihalomethanes (TTHM) and 0.06 mg/L for 5 Haloacetic Acids (HAA5).

Stage 1 Disinfection Byproducts Rule

- Maximum Residual Disinfectant Level, MRDL
 - Limits maximum amount of residual allowed in system
 - 4 mg/L for chlorine and chloramines
 - Applies to CWS, NTNCWS
 - 0.8 mg/L for chlorine dioxide
 - Applies to TNCWS

Surface Water Treatment Rules

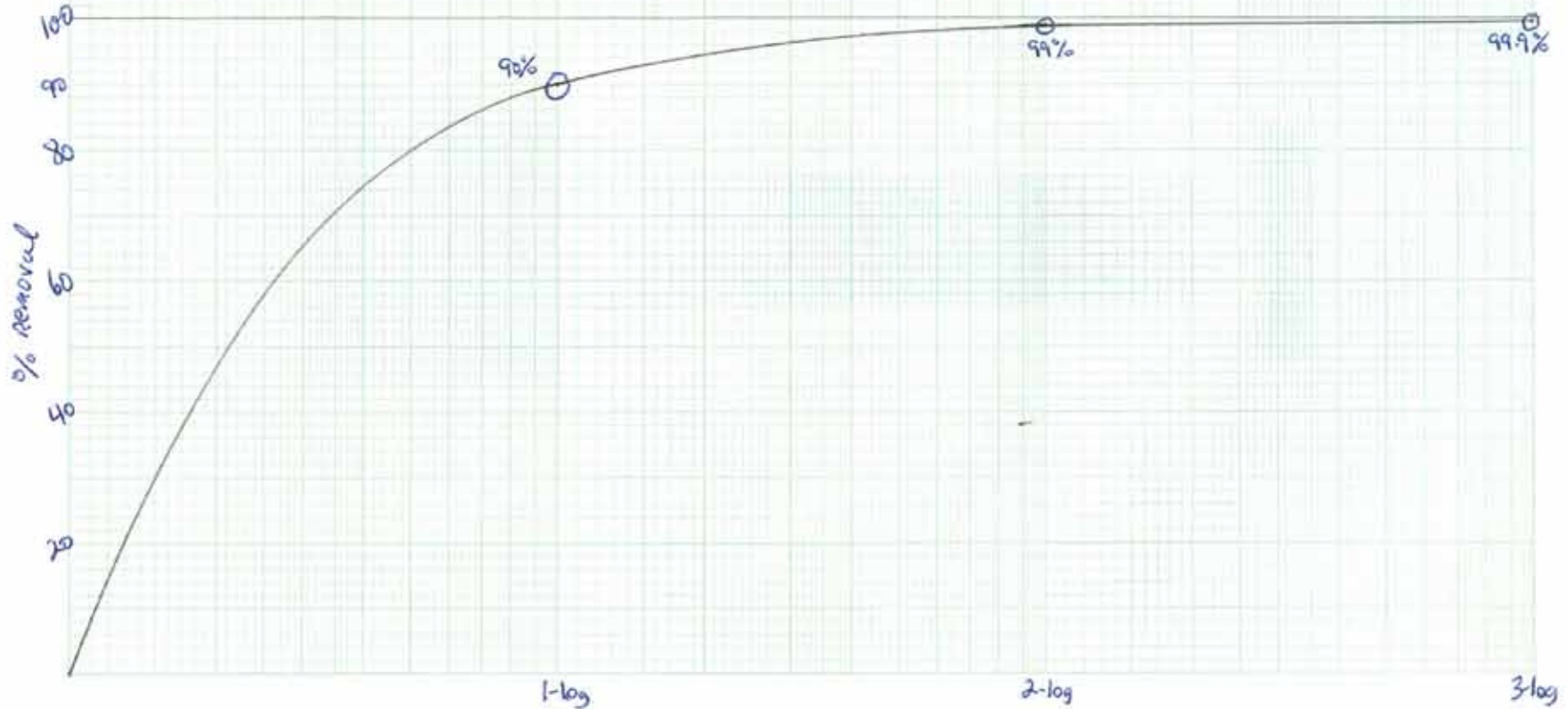
- Surface Water Treatment Rule (SWTR) published in 1989, the Interim Enhanced Surface Water Treatment Rule (IESWTR) published in 1998 and Long Term 1 Enhanced Surface Water Treatment Rule . LT1ESWTR published in 2002.
- IESWTR applies to surface water systems serving populations $\geq 10,000$. LT1ESWTR applies to water systems serving populations $< 10,000$. These rules strengthen SWTR.
- Ground Water Under the direct influence of surface water (GWUDI) systems also affected by these rules.

Surface Water Treatment Rules

- Goal of these rules is to remove and inactivate harmful microorganisms, in particular, Giardia (remove/inactivate 99.9% or 3-log), viruses (remove/inactivate 99.99% or 4-log) and cryptosporidium (remove/inactivate 99% or 2-log)
- Cryptosporidium is difficult to inactivate through disinfection. Must rely more on removal through filtration.

Log Removal

$$\% \text{ removal} = 100 (1 - 1/10^{(\log \text{ rem})})$$



Surface Water Treatment Rules

- It is easier and cheaper to measure turbidity than micro-organisms in water. Turbidity is an effective indirect measure of micro-organism concentration so MCLs and treatment goals in terms of turbidity.
- Turbidity is a measure of the clarity of the water. It is measured in Nephelometric Turbidity Units (NTU). The meter measures reflected light from a light source passed through a sample.

Surface Water Treatment Rules

- Conventional and direct filtration systems must produce water with ≤ 0.3 NTU in 95% of readings of combined filtered water and should not exceed 1 NTU.
- Continuous monitoring of individual filter effluent (IFE) and combined filter effluent (CFE) measured every 4 hours is required.
- Operator is required to submit to DWB a Monthly Operating Report (MOR) with flow, turbidity and disinfectant residual data.

Surface Water Treatment Rules

Multi-barrier approach to treatment is desired:

- Source control. Minimize impacts to water source
- sedimentation
- filtration
- disinfection
 - required for surface water systems
 - Sufficient inactivation is achieved through both adequate disinfectant residual (C) and adequate contact time (T) prior to the first customer
 - LT2ESWTR and IESWTR have requirements for CT to achieve adequate inactivation of Giardia and viruses
 - There is also a requirement to maintain a detectable amount of residual disinfectant in the distribution system.

Record Maintenance

- Title 20 Chapter 7, Part 10, Subpart D, Reporting & Recordkeeping, 141.33 pg. 406
 - Bacteriological analyses: 5 yrs.
 - Chemical analyses: 10 yrs.
 - Action taken to correct violations: 3 yrs.
 - Written reports, summaries or communication relating to Sanitary Surveys: 10 yrs.
 - Variance or Exemption granted: 5 yrs.
 - Public Notices of Drinking Water Violations: 3 yrs.

Consumer Confidence Rule

- Drinking Water Systems must keep customers informed of the quality of their drinking water and of any violations of SDWA.
- Consumer Confidence Report due by July 1 annually. Must retain copies for 3 years.
- Applies to all CWS.
- Content must include basic water system information, definitions, source water information, compliance with rules, educational information.
- Method of delivery depends on size of population served.
- CCR writer available from DWB. There is also an online version managed by EPA. www.ccriwriter.com

Public Notification Rule

- Published in 1989, revised in 2000.
- Requires notification of the public when certain SDWA violations occur.
- 3 different tiers of notification, based on severity of the violation
 - Tier 1: Requires public notification within 24 hours. Also requires system to consult with state within 24 hours. Examples: acute TCR violation, Nitrate MCL violation, waterborne disease outbreak.
 - Tier 2: Requires public notification ASAP but within 30 days. Example: MCL violations, monitoring violations.
 - Tier 3: Requires annual notification. Examples: monitoring violations, operation under a variance.
- Method of notification depends on tier and may require input from state.

New Federal Rules

- Stage 2 Disinfection Byproducts Rule. Signed December 15, 2005, will be published January, 2006. New sampling requirements for systems that disinfect.
- Long Term 2 Enhanced Surface Water Rule. Signed December 15, 2005, will be published January, 2006. Impacts all systems that use surface water and Ground Water Under Direct Influence of Surface Water.
- Ground Water Rule. Promulgated October 11, 2006. Will result in additional short-term monitoring for ground water systems that don't chlorinate and may result in more systems chlorinating.