AN OVERVIEW OF THE SAFE DRINKING WATER ACT REGULATIONS

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Federal Safe Drinking Water Act (SDWA)

40 CFR Part 141 Subparts A - Y

https://www.env.nm.gov/dwb/regulations/documents/NationalPrimaryDrinkingWaterRegulations_CFR-2013-title40-vol24-part141_pub.7.28.16.pdf

A Couple of Useful References:
EPA Quick Reference Guides

National Environmental Services Center at WV University Tech Briefs

Safe Drinking Water Act

- Public Water Systems
- Primary Contaminants
- Maximum Contaminant Levels (MCL)
- Inorganic Contaminants
  - Lead and Copper Rule
  - Nitrate and Nitrite
  - Fluoride
  - Turbidity
- pH
- Dissolved Oxygen
- Temperature
- Organic Contaminants
- Radioactive Contaminants
- Bacteriological Contaminants
  - Bacteriological Violations
- Secondary Contaminants
- Monitoring and Reporting
- Sampling Schedules
- Public Notification
- Action Plans for Violations
- Variances and Exemptions
- Surface Water Rule
- Disinfectants and Disinfection By-Products Rule
- Ground Water Rule
- Consumer Confidence Reports

Safe Drinking Water Act (SDWA)

- SDWA passed by Congress in 1974

  Primary goal is to set health based standards for drinking water to protect against both man-made and naturally-occurring contaminants
- 1986/1996/2016 Amendments (link w/ 2018 WQCC WQS reg changes)
  - Requires additional protection of water sources- rivers, lakes, reservoirs, springs and groundwater wells; RTCR

Public Water Systems

- "Public water system means a system for the provision to the public of water for human consumption through pipes or after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year."

40 CFR 141.2 (4-16-07 edition)

A public water system is either a…

- Community—"a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents."
- Non-Transient Non-Community—"a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year." (Examples: schools, senior centers, detention centers etc.)
- Transient Non-Community—"a non-community water system that does not regularly serve at least 25 of the same persons over six months per year." (Examples: rest stops, convenience centers, restaurants etc.)

Primary Contaminants

Certain substances and organisms in drinking water have been determined to cause adverse acute or chronic health effects. They are referred to as primary contaminants and are regulated by MCLs. These substances can be grouped into four major categories:

1) Inorganic Contaminants
2) Organic Contaminants
3) Radiological Contaminants
4) Microbiological Contaminants

1) Inorganic Contaminants

- These contaminants are mostly heavy metals (by RCRA definition), but also include other non carbon-based chemicals
  - 15 contaminants
    - Nitrate, Nitrite, Total Nitrate/Nitrite and Asbestos are exceptions to the Standard Monitoring Framework
  - They may enter the water supply naturally through groundwater formations or from mining runoff and industrial discharges

Inorganic Contaminant	MCL (mg/L)
Antimony	0.006
Arsenic	0.010
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide (as free Cyanide)	0.2
Mercury	0.002
Selenium	0.05
Thallium	0.002
Copper	*1.3* Action level*
Lead	*0.015* Action level*
Nitrate (as N) – Acute (chemical)	10
Nitrite (as N)	1
Total Nitrate/Nitrite (as N)	10
Fluoride	*2.0 Secondary MCLG* *4.0 Violation*
Turbidity – Acute (physical)	0.3 NTU in 95% of samples 1 NTU maximum
Asbestos	7,000,000 Fibers/L

Lead and Copper

- Sampling must be conducted for lead and copper that may be present at the customer's tap. Most of the lead and copper found this way comes from the customer's plumbing

- The system will be responsible for treating the water to stabilize the corrosive qualities that cause the leaching of lead and copper from the customer's plumbing if the Action Levels are exceeded

Nitrate and Nitrite

- Nitrate and nitrite are the only chemical contaminants that represent an immediate health risk
  - Pregnant women and infants under 18 months can develop a condition known as “Blue Baby Syndrome” or methemoglobinemia

Fluoride

- Help prevent tooth decay
- The optimum dosage for fluoride is 0.8-1.2 mg/L. At higher concentrations fluoride can:
  - create stains on teeth in children and
  - leads to brittle bones in older individuals
- The optimum dosage for fluoride is determined by the average ambient air temperature of the system

Turbidity

- Turbidity is clay, silt or mud in the water.
  - Although turbidity does not represent a health risk by itself, it can shield harmful bacteria from disinfection processes.
- Turbidity is measured in Nephelometric Turbidity Units (NTU).
- The device used to measure NTU's is called a nephelometer or turbidimeter.

Inorganic Contaminants continued

- The following 3 physical parameters – pH, DO, temperature typically do not create adverse health effects though they can contribute to them

- They are used to evaluate water quality or are used for process control

pH – Power of Hydrogen

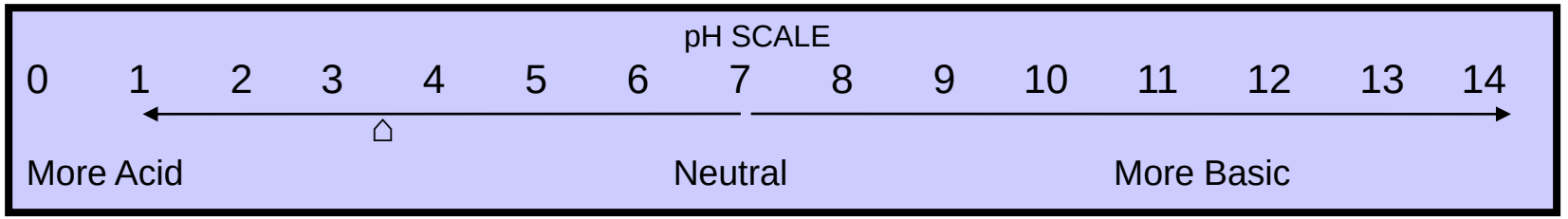
- pH is the measurement of the hydrogen ion, H+ or acid concentration of a fluid.
  - Water is considered to be acidic when it has more hydrogen ions (H+) than hydroxide ions (OH-)
  - Water is considered to be basic when there are more hydroxide ions (OH-) than hydrogen (H+)
    - Chemicals that add hydrogen ions (H+) are:

      hydrochloric acid, (HCl), sulfuric acid, (H_2SO_4), nitric acid, (HNO_3), and carbonic acid, ($H_2\ CO_3$)
    - Chemicals that add hydroxide ions (OH-) are:

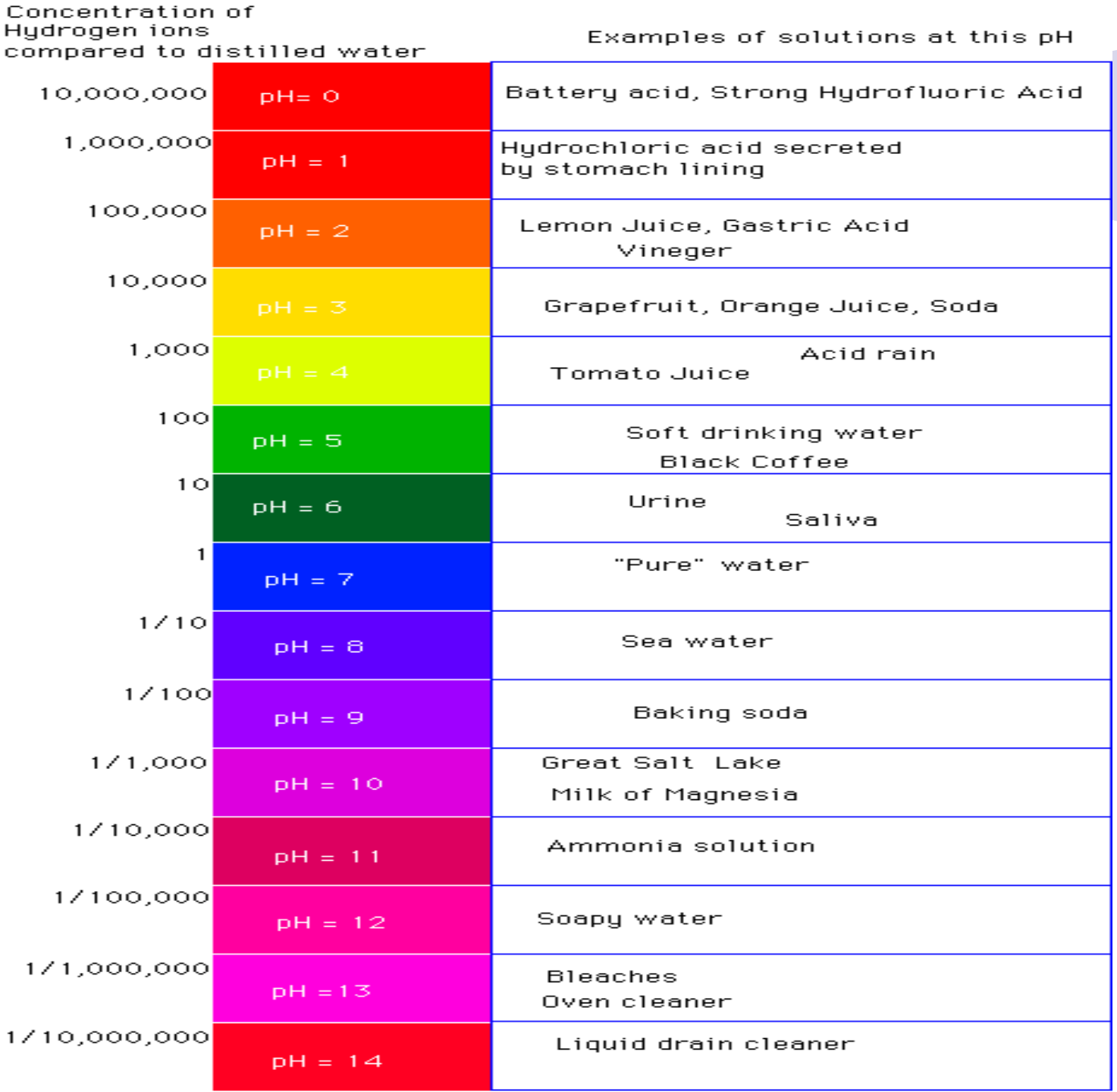
      sodium hydroxide, (NaOH), calcium hydroxide, ($Ca(OH)_2$), and magnesium hydroxide, ($Mg(OH)_2$)

pH – Power of Hydrogen

The pH of water is measured on a scale that reads from 0 to 14, where 7 is neutral



- For every whole number that the pH changes the strength of the acid or base properties of the fluid will change by a factor of ten
  - pH of 9 to a pH of 10 becomes 10 times more basic
  - pH of 5 is 10 times more acid than water at a pH of 6


Concentration of Hydrogen ions compared to distilled water
Examples of solutions at this pH
10,000,000
pH= 0
Battery acid, Strong Hydrofluoric Acid
1,000,000
pH = 1
Hydrochloric acid secreted by stomach lining
100,000
pH = 2
Lemon Juice, Gastric Acid
Vineger
10,000
pH = 3
Grapefruit, Orange Juice, Soda
1,000
pH = 4
Acid rain
Tomato Juice
100
pH = 5
Soft drinking water
Black Coffee
10
pH = 6
Urine
Saliva
1
pH = 7
"Pure" water
1/10
pH = 8
Sea water
1/100
pH = 9
Baking soda
1/1,000
pH = 10
Great Salt Lake
Milk of Magnesia
1/10,000
pH = 11
Ammonia solution
1/100,000
pH = 12
Soapy water
1/1,000,000
pH =13
Bleaches
Oven cleaner
1/10,000,000
pH = 14
Liquid drain cleaner

Dissolved Oxygen, DO

- DO determines the oxygen level in potable and non-potable waters

Sample Measurement

- The DO should be measured at a representative point
  - Remember…DO is a gas and is affected by turbulence and temperature
    - Measuring DO at a point of high turbulence will not be representative
    - Likewise, measuring DO in shallow or quiet areas of a river will be different than in deeper and faster moving areas
  - A sampling plan will help define what information is needed and where the most appropriate location will be

Temperature

- Accurate temperature measurements are critical to many of the tests that are performed in the laboratory and out in the field.
- Measurements should be made with a good mercury thermometer or digital thermometer.
- Use thermometers that have the sensitivity required for each test.
  - Typically use a thermometer with 0.1º C accuracy
  - Make sure you know temperature reqts for samples

2) Organic Contaminants

- There are 51 of these contaminants:
  - herbicides and insecticides that are primarily used in agriculture applications,
  - organic solvents used in industrial applications,
  - organic by-products of industrial processes, and
  - chemical by-products from chlorination of drinking water

SOURCES OF CONTAMINATION INCLUDE:

- Runoff from agricultural spraying
- Industrial discharges
- Accidental spills
- Improper disposal of hazardous wastes

Organic Contaminants

Contaminant	MCL (mg/L)	Contaminant	MCL (mg/L)
Acrylamide	**TT[1]**	**Lindane**	**0.0002**
Alachor	**0.002**	**Methoxychlor**	**0.04**
Atrazine	**0.003**	**Oxamyl (Vydate)**	**0.2**
Benzene	**0.005**	**Polychlorinated byphenyls (PCBs)**	**0.0005**
Benzo(a)pyrene	**0.0002**	**Pentechlorophenol**	**0.001**
Carbofuran	**0.04**	**Picloram**	**0.5**
Carbon Tetrachloride	**0.005**	**Simazine**	**0.004**
Chlordane	**0.002**	**Styrene**	**0.1**
Chlorobenzene	**0.1**	**Tetrachloroethylene**	**0.005**
2,4-D	**0.07**	**Toluene**	**1**
Dalapon	**0.2**	**Toxaphene**	**0.003**
DBCP	**0.0002**	**Trichloroethylene**	**0.005**
o-Dichlorobenzene	**0.6**	**2,4,5-TP (Silvex)**	**0.05**
p-Dichlorobenzene	**0.075**	**1,2,4-Trichlorobenzene**	**0.07**
1,2-Dichloroethane	**0.005**	**1,1,1-Trichloroethane**	**0.2**
1,1-Dichloroethylene	**0.007**	**1,1,2-Trichloroethane**	**0.005**
cis-1,2-Dichloroethylene	**0.07**	**Vinyl chloride**	**0.002**
trans-1,2-Dichloroethylene	**0.1**	**Xylenes (total)**	**10**
Dichlormethane	**0.005**		
1,2-Dichloropropane	**0.005**		
Di(2-ethylhexyl) adipate	**0.4**		
Di(2-ethylhexyl) phthalate	**0.006**		
Dinoseb	**0.007**		
Dioxin	**0.00000003**		
Diquat	**0.02**		
Endothall	**0.1**		
Endrin	**0.002**		
Epichlorohydrin	**TT[1]**		
Ethylbenzene	**0.7**		
Ethylene dibromide	**0.00005**		

[1] – TT refers to approved Treatment Technology rather than MCL

3) Radiological Contaminants

- Most radioactive substances occur naturally in ground water and in some surface supplies

- Some man-made substances may also enter drinking water supplies from processing facilities, mining areas, and nuclear power plants

Radioactive Contaminants

The 4 contaminants include:

Contaminant	MCL
Radium 226 and 228	5 pCi/L
Gross Alpha Activity	15 pCi/L
Gross Beta Activity (man-made)	4 millirem/yr or 50 pCi/L
Uranium	30 μg/L (ppb)

4) Bacteriological Contaminants

- The total coliform group of bacteria represents the indicator organisms used in determining bacteriological contamination
  - coliforms in water include escherichia (E. coli – Acute biological), citrobacter, enterobacter & klebsiella

- Their presence indicates the possibility that some pathogenic (disease causing) organisms may also be present

Drinking Water Regulations

- Sets the number of samples a water system must submit per month (minimum of 1 for lowest population category)
- Larger systems require more samples each month (maximum 480)
  - Number of samples may be reduced by NMED-DWB
  - Compliance is based on routine and repeat samples

RTCR Monitoring Frequency

Population Served*	Minimum Number of Samples per Month; all PWSs
25 - 1,000	1
1,001 – 2,500	2
2,501 – 3,300	3
3,301 – 4,100	4
4,101 – 4,900	5
4,901 – 5,800	6
5,801 – 6,700	7
6,701 – 7,600	8
7,601 – 8,500	9
8,501 – 12,900	10

* See rule (40 CFR 141.21.a.2) for additional population categories

RTCR Sampling

What happens when a routine sample is either Total Coliform or *E.Coli* Positive?

- All systems are required to collect repeat sampling
- Repeat sampling will be limited to three repeat samples for every routine positive result. (Plus triggered source sampling to comply with the Ground Water Rule, if applicable – ref pdf Exhibit 1.1 Summary of GWR Rqts, Oct 2008 Sanitary Survey Guidance Manual for GW Systems)
- Repeat Samples do not have to be collected within 5 connections upstream or downstream.
- RTCR allows for alternative repeat sampling locations if a PWS believes that that those alternative locations are representative of pathways for contamination of the distribution system
- Sampling from alternative locations must be approved by DWB prior to repeat sampling event by system submitting SOP to designate alternate sites

RTCR Sampling

- What Violations are triggered by RTCR sampling events?

  A PWS is in violation of the *E.Coli* MCL if:

  - A PWS has an EC+ repeat sample following a TC+ routine sample
  - A PWS has a TC+ repeat sample following an EC+ routine sample
  - A PWS fails to take all required repeat samples following an EC+ routine sample

  E.Coli MCLs require the PWS to issue a Tier 1 public notice which includes a Boil Water Advisory

National Secondary Drinking Water Regulations 40 CFR 143

- Secondary Maximum Contaminant Level Goals (SMCLGs) - examples:

Secondary Contaminants	SMCLG (mg/L)
TDS	500
Chloride	250
Sulfate	250
Iron	0.3
Manganese	0.05
pH	6.5-8.5

- Monitoring
  - ✓*Not Enforceable*
  - ✓*Goals or Guidelines for the States*

Monitoring and Reporting

Water systems are responsible for:

- Monitoring water quality and
- Reporting violations to the public

  - NMED-DWB is currently collecting and submitting chemical and radiochemical samples to the laboratories

  - Systems are still responsible for the results of testing and any public notification that may be required

  - Systems are required to report to NMED-DWB within 48 hours if they fail to comply with any NM Drinking Water Regulation

Systems must retain records for:

- *Bacteriological samples: 5 years*
- *Chemical samples: 10 years*
- *Records of actions taken to correct violations: 3 years after last action*
- *Reports, correspondence, communications and sanitary surveys: 10 years*
- *Variance granted to the system: 5 years following the expiration of the variance*
- *Lead and copper samples: 12 years*
- *Consumer Confidence Reports: 3 years*

Sampling Schedules

Chemical & Radiological Baseline Monitoring of Drinking Water

Chemical Monitoring

For inorganic chemicals, monitoring frequency is dependent upon the water source and contaminant being sampled.

Radiological Monitoring

Initial sampling of 4 quarters composited.

ALL PWS MUST BE SAMPLED WITHIN 90 DAYS OF COMING ON LINE

Sample Collection Frequency

Ground Water

Nitrate—Annual (If 1 sample ≥ 5 mg/L, 1/4ly at least 1 year) All systems; No waiver

Nitrite—1 time only (if result is < 0.5 mg/L) All systems

Asbestos—Every 9 years (1st period of cycle if no waiver) CWS & NTNCWS

Others—Triennial - CWS & NTNCWS

Surface Water

Nitrate—Quarterly (reduced to annual if none >5 mg/L) All systems

Nitrite—1 time only (if result is < 0.5 mg/L) All systems

Asbestos—Every 9 years (same as groundwater system) CWS & NTNCWS

Others—Annual - CWS & NTNCWS

A CONFIRMATION SAMPLE IS REQUIRED WHEN THE MCL IS EXCEEDED

DISTRIBUTION SYSTEM SAMPLE PLANS (DSSP)

Compliance Sampling Sites

- Compliance sampling will either occur at:
  - Entry Point (EP) —Point where treated water enters the distribution system; regulatorily defined
  - Point-of-Use (POU)—Location where water is drawn directly from customers' plumbing fixtures

DSSPs

The DSSP shall, at a minimum, include the following:

- A written description of the system
- A map of the water supply system showing the general layout of the system
- A written description of the sampling sites to be used
- The name of the laboratory(s) to be used

Plan must be reviewed and approved by NMED-DWB; instructions & DSSP template available from: https://www.env.nm.gov/dwb/RTCR.htm

DSSPs

Systems need to have a DSSP for at least the following:

- Microbiological Sampling – routine & repeat sites (RTCR)
- Disinfectants and Disinfection By-products
- Lead and Copper
- Asbestos

NMED-DWB should have a copy of the DSSP on file

The Microbiological portion of the DSSP will be reviewed based on the following criteria:

- At least one sampling site shall be chosen for each major portion and each isolated portion of the distribution system
- All sampling sites chosen should be sampled at least every four months
- Site alternatives may be accepted within five connections up or down from the designated site
- Public water systems, which collect six or more samples per month, shall collect them at regular time intervals throughout the month

Public Notification

Divided into 3 tiers

- Takes into account the seriousness of the violation or situation and any potential adverse health effects

- Systems must notify the public and NMED-DWB
  - Certification to NMED-DWB within 10 days after public notification

Standards & Frequency

Tier 1—Significant potential health risks with short term exposure—24 hours

- Radio
- TV
- Hand Delivery
- Posting
- Other methods specified by State

Tier 2 Potential health risks—30 days

- Mail or direct delivery for CWSs
- Mail, direct delivery or posting for NCWs
- No longer applies to TC+

Tier 3 No potential health risks—1 year

- Same as Tier 2
- CCR

Action Plans for Violations

- If a water supply exceeds the primary standards the water system must either:
  - cease using water from the contaminated source,
  - provide adequate treatment to remove the contaminants,
  - or locate a new source of supply that meets the standards
- Blending may be done under certain conditions
  - The blended water must enter the system from a single point of entry

Variances, Exemptions and Waivers

- A system may be granted a variance or exemption if the MCL is exceeded and is unable to correct the problem due to financial or technical reasons
- All requests for variances, waivers, and exemptions must be directed to and approved by the NMED-DWB
- Not allowed for acute hazards
- Waivers can be applied to sample frequencies

Surface Water Rules

- Any system that uses surface water must provide treatment of the supply
- Springs and infiltration galleries are considered surface supplies if they are found to have groundwater that is under the direct influence of surface water (GWUDI)
  - A speciation study of the organisms found in the suspected source of influence and the water that enters the system is used to determine whether a source is GWUDI

Surface Water Rules

- Interim Enhanced Surface Water Treatment Rule (IESWTR) – now expired
  - 10,000 or more population
- Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) – now expired
  - <10,000 population
- Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) – now in effect
  - Schedule 1—100,000 or more population
  - Schedule 2—50,000 to 99,999 population

Removal or Inactivation of *Giardia*

The concerns about contamination have created the need for higher free chlorine residuals and longer disinfection contact times

- The “CT” calculation is used to determine the necessary contact time at a given chlorine residual concentration
  - C x T = the CT factor

    C is the disinfectant concentration,

    T is the contact time in minutes,

    CT is a temperature & pH-based constant

Removal of *Cryptosporidium*

- 2-log reduction of the numbers found in raw water for IESWTR and LT1 systems
  - 2-log removal or deactivation would mean that 1% of the bacteria may survive or 99% are removed
  - 4-log removal or deactivation would mean that 0.01% of the organisms may survive or 99.99% are removed
- Some larger LT2 systems may be required to provide a 5.5-log removal
- Log removal credits are assigned to the various treatment processes

Disinfectants and Disinfection Byproducts Rule

- Applies to all CWSs and NTNCWSs that add disinfectant and TNCWSs that use chlorine dioxide
  - Subpart H systems serving ≥ 10,000 people (January 1, 2002)
  - Subpart H systems serving < 10,000 people and ground water systems that chemically disinfect (January 1, 2004)

- Trihalomethanes and haloacetic acids are formed when chlorine, bromine, or iodine combine with organic precursors that may be present in the source water
  - Recent changes have set new MCLs for several disinfection by-products
- Systems that use ozone as a disinfectant may also create bromates
- All of these chemicals are carcinogens

Stage 1 D-DBP

- New Maximum Residual Disinfectant Level Goals (MRDLGs) and MRDLs for 3 disinfectants (Chlorine, chloramines and chlorine dioxide)
- More stringent MCL for Total Trihalomethanes (TTHMs)
- New MCL for 5 Haloacetic Acids (HAA5s), Bromate and Chlorite (plants that use ozone and chlorine dioxide)

Stage 2 D-DBP

- Builds upon existing rules
- Identify more appropriate monitoring sites for DBPs
  - Initial distribution system evaluations (IDSEs) to investigate TTHM and HAA5 levels in the distribution system
- Improve protection of public health by reducing exposure to DBPs

Stage1 and Stage 2 D-DBP

- Stage1 D-DBP set MCLs based on a running annual average (RAA) of samples taken in the system, rather than individual sample results

- Stage 2 D-DBP has changed to use the location-based running annual average (LRAA) of each individual contaminant for the calculation

D-DBP Rule Contaminants

Contaminant	MCL (mg/L)
Total Trihalomethanes (TTHM)	0.080
Halo Acetic Acids (HAA5)	0.060
Bromate	0.010
Chlorite	1
Chlorine Dioxide	0.8
Chlorine (MRDL)	4
Chloramines	4

Stage1 and Stage 2 D-DBP

- A system that is in violation may be required to change to a different means of disinfection or incorporate an additional process
- Sample results from D-DBP testing must be reported within 10 days of the end of the monitoring period
- Chlorine residual reports must be submitted every quarter

Stage1 and Stage 2 D-DBP Chlorine Residual Report

MONTHLY DISINFECTANT RESIDUAL REPORT

FOR PUBLIC WATER SYSTEMS

SYSTEM NAME: _____

WATER SYSTEM ID # _____

Months _____ Year _____ Number of Active Service Connections this Month: _____

Chlorine Residual Readings (mg/L)

Date	Month #1	Month #2	Month #3
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
Avg			
Max			
Min			

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____

Stage1 and Stage 2 D-DBP Chlorine Residual Report

State of New Mexico
ENVIRONMENT DEPARTMENT
DRINKING WATER BUREAU
PO Box 5469
Santa Fe, NM 87502
Tel. 505-476-8635 • Fax 505-476-8656
Toll Free 1-877-654-8720
www.env.nm.gov/dwb/index.htm

DISINFECTANT LEVEL QUARTERLY OPERATING REPORT (DLQOR)

Quarter: _____ **Year:** _____

Water System Name: _____ **System ID #** _____

First Month of Quarter: Monthly Summary

Average of all disinfectant Residuals for this month		Number of residuals collected this month		Number of readings with NO Residual for this Month			
	mg/L		readings		Readings		%

Second Month of Quarter: Monthly Summary

Average of all disinfectant Residuals for this month		Number of residuals collected this month		Number of readings with NO Residual for this Month			
	mg/L		readings		Readings		%

Third Month of Quarter: Monthly Summary

Average of all disinfectant Residuals for this month		Number of residuals collected this month		Number of readings with NO Residual for this Month			
	mg/L		readings		Readings		%

Quarterly Summary

Average of all disinfectant Residuals for this Quarter		Lowest Residual for this Quarter		Highest Residual for this Quarter	
	mg/L		mg/L		mg/L

Running Annual Average Summary

Average of all disinfectant Residuals for the previous 12 Months	
	mg/L

NAME: _____ **TITLE:** _____

LICENSE # _____

ADDRESS: _____ **CITY:** _____

STATE: _____ **ZIP CODE** _____

PHONE # _____

SIGNATURE: **DATE:**

DLQORs are required to be submitted to NMED-DWB No Later than the Dates Noted Below

Quarter 1	*Quarter 2*	*Quarter 3*	*Quarter 4*
Disinfectant Residuals for January, February, & March	Disinfectant Residuals for April, May, & June	Disinfectant Residuals for July, August, & September	Disinfectant Residuals for October, November, & December
Report due by April 10th	Report due by July 10th	Report due by October 10th	Report Due by January 10th

Measuring Chlorine Residual

- Free chlorine
  - DPD + free chlorine = pink color
  - 60 sec – 3 min; best 60 sec (worst-case)
- Total chlorine
  - DPD + KI + chlorine = I_2 + DPD = pink color
  - 3 – 6 min; best 3 min (worst-case)

Ground Water Rule

- The Ground Water Rule (GWR) was proposed to establish a strategy for identifying ground water systems that are at high risk for fecal contamination
- Community water systems with outstanding performance and non-community water systems had until December 31, 2014 to complete the initial sanitary survey
- All other community water systems had to complete their initial survey by December 31, 2012

The GWR is comprised of four major components:

1) Periodic sanitary surveys (CWS every 3 yrs, NTNC every 5 yrs) to identify and evaluate significant deficiencies such as defective casings or location too close to sources of surface pollution

2) Monitoring of source water for the presence of *E. coli* and other enteric organisms

3) Corrective action must be taken by any system with significant deficiencies or source water contamination

This could include:

A. Correcting structural deficiencies

B. Eliminating the source of contamination

C. Finding an alternative source of water

D. Providing treatment to achieve a 4-log inactivation or removal of viruses

4) Compliance monitoring to ensure that the treatment reliably achieves a 4-log reduction or inactivation of viruses

Consumer Confidence Reports

- Applies only to community water systems
- Summarizes information regarding sources used (i.e., rivers, lakes, reservoirs, or aquifers)
- Includes any Detected contaminants
- Includes Compliance information
- Includes Educational information

The report is due by:

- July 1st of each year to customers and NMED-DWB
- October 1st NMED-DWB must receive certification that the CCR has been distributed
- DWW data generator and EPA CCRiWriter (now available through EPA website)

Chain of Custody Documentation

- ALL samples must be sealed with red evidentiary seal tape and include a “Chain of Custody”
- This document identifies who has handled the sample
  - The time and date are also recorded at each step of the process
- Failure to properly document the chain of custody will result in sample rejection

DWB C-o-C Form Effective January 2019

ACME Inc. Lab, 1606 University Blvd SE, Albuquerque, NM 87121, 505-444-8111 Lab ID# BR549

Test Method: SM 9223B Lab Sample ID# _____

Water Supply System Name:				
WSS Code No. (5 digits) NM35 _____		Chlorine Yes/No	Free: _____mg/l	Total: _____mg/l
Date Collected:	Time Collected (24 hr):			

Please circle the "Type" of sample from one of the Six selections below and fill out the information for your selection (all shaded boxes must be filled out completely). Only one selection per sample submitted. All samples are considered "For Compliance" except for Special samples.

1. Routine	Sample Point ID: RT _ _ _	Location:	
2. Repeat	Sample Point ID: RP _ _ _ _	Location:	
	Original Lab Sample ID# _____		
3. GW Triggered Source	Source Facility ID# _ _ _ _ _ _ _ _	Source Facility Name:	
	Original Lab Sample ID# _____		Sample Point ID# SP _ _ _ _ _ _ _ _ 1
4. GW Repeat (only if GW triggered was ec+)	Source Facility ID# _ _ _ _ _ _ _ _	Source Facility Name:	
	Triggered Source Lab Sample ID# _____		Sample Point ID# SP _ _ _ _ _ _ _ _ 1
5. Special	Location:		
6. E-Coli Enumeration (LT2)	Facility ID# _ _ _ _ _ _ _ _	Facility Name:	
	Turbidity (ntu's) _____		

FIELD SAMPLE DATA & REMARKS		pH:	Conductivity (µS/cm)	Temp. (°C):
Comments:				
Collected By (print):		Operator ID# (5 digits) NM _____	Phone Number:	
Relinquished by (signature):			Date:	Time: (24 hr.)
Received by name:	Signature:		Date:	Time: (24 hr.)
Relinquished by name:	Signature:		Date:	Time: (24 hr.)
Received by name:	Signature:		Date:	Time: (24 hr.)
SAMPLE RECEIPT CONDITION	Temp (°C):		Custody Seals: Yes/ No	Intact: Yes/ No
Preservative: Ice Yes/ No	Comments:			

Test			Test Results	
Start	Date: _____	Time (24 hr) _____	Volume Assayed: _____ ml	
			TC (P/A) _____	EC (P/A) _____
Finish	Date: _____	Time (24 hr) _____	EC Enumeration: (per 100 ml) _____	(units?)

First Analyst: _____ Date: _____ Time (24 hr) _____

Required Items to be Filled Out on Chain-of-Custodies by Sampler

- Water System Name (as it appears in SDWIS)
- WSS Code (as it appears in SDWIS) ex. NM3512345
- Sample Chlorinated: Yes or No (if Yes - type and level must be filled out; if No - leave blank) DO NOT PUT N/A!!!
- Date Sample Collected
- Time Sample Collected
- Type of Sample, circle only one: Routine or Repeat, or GW Triggered Source, or GW Repeat, or Special, or E-Coli Enumeration.
- Fill out required items on lines for Sample Type selected.
- Field Sample Data Remarks (if any)
- Collected By (printed)
- Relinquished by (signed)
- New Mexico Operator ID# (5 digits total, use leading zeros if less than 5) ex. 117 becomes 00117
- Samplers Phone Number
- Date Relinquished
- Time Relinquished

Field and Chemical Safety

Many samples require the addition of acid for preservation

Always…Add acid to water, NOT water to acid

- Precautions to remember are:
  - Work in ventilated area
  - Do not inhale the fumes
  - Wear skin and eye protection

Field and Chemical Safety

- Burns—Flush under Cold Water
- Bleeding Cuts—Apply Pressure
- Spider Bites—Apply Ice & seek medical attention
- Acid on Skin or in Eyes—Wash for 15 min. with clean water & seek medical attention

Safety Data Sheets (SDS)

- Needed when a physical hazard is present
- Employers must:
  - Provide access to SDSs
  - Ensure that Labels & other warnings are displayed
  - Provide employees with Training

**** MATERIAL SAFETY DATA SHEET ****

Hydrochloric Acid
11155

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Hydrochloric Acid
Catalog Numbers:
144J212, A142 212, A142-212, A142212, A142P 20, A142P-20, A142P20, A144 212 A144 500, A144 500LB, A144 612GAL, A144-20, A144-212, A144-500, A144-500L, A144-500LB, A144-612G, A144-612GAL, A144-612GL, A144212, A144500, A144500LB A144500LB02, A144612GAL, A144C 212, A144C-2.5, A144C-212, A144C212, A144C212001, A144FP 500, A144FP500, A144P 20, A144P 500, A144P-1GA, A144P-1GAL, A144P-20, A144P20, A144P500, A144S 212, A144S 500, A144S-212, A144S-500, A144S212, A144S500, A144SI 212, A144SI-21, A144SI-212, A144SI212 A466 1, A466 250, A466 500, A466-1, A466-2, A466-250, A466-500, A4661, A4662, A466250, A466500, A481 212, A481-212, A481212, A508-212, A508-500, A508212 001, A508212 002, A508212001, A508212002, A508212003, A508212004, A508SK212, CRNA481 212, CRNA481212, S71942SCMF, SA431-500, SA48-1, SA48-20, SA48-4, SA48-500
Synonyms:
Chlorohydric acid, hydrogen chloride, muriatic acid, spirits of salt.
Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410
For Information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
7647-01-0	Hydrogen chloride	36-38%	231-595-7
7732-18-5	Water	62-64%	231-791-2

Hazard Symbols: C

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Appearance: Clear, colorless to faintly yellow.
Danger! Corrosive. Sensitizer. Causes eye and skin burns. May cause severe respiratory and digestive tract irritation with possible burns.
Target Organs: None.

Potential Health Effects
Eye:
May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns.
Skin:
May be absorbed through the skin in harmful amounts. Contact with liquid is corrosive and causes severe burns and ulceration.
Ingestion:
May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.
Inhalation:
Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances.
Chronic:
Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth.
May cause conjunctivitis and photosensitization.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.
Skin:
Get medical aid. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.
Ingestion:
Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.
Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Treat symptomatically and supportively.
No specific antidote exists.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool.
Extinguishing Media:
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: Not published.
Explosion Limits, Lower: Not available.
Upper: Not available.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:
Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get on skin or in eyes. Do not ingest or inhale.
Storage:
Keep away from heat and flame. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydrogen chloride	C 5 ppm; C 7.5 mg/m3	C 5 ppm; C 7 mg/m3	C 5 ppm; C 7 mg/m3
Water	none listed	none listed	none listed

OSHA Vacated PELs:
Hydrogen chloride:
C 5 ppm; C 7 mg/m3
Water:
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment
Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to prevent skin exposure.
Respirators:
Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: Clear, colorless to faintly yellow.
Odor: Strong, pungent.
pH: 1.1 (0.1N sol).

Vapor Pressure: 160 mm Hg
Vapor Density: 1.257 (Air=1)
Evaporation Rate: 2.0 (Butyl acetate=1)
Viscosity: Not available.
Boiling Point: 230 F
Freezing/Melting Point: -101 F
Decomposition Temperature: 3239.6 F
Solubility: 823g/L water at 32F.
Specific Gravity/Density: 1.16-1.19 (Water=1)
Molecular Formula: HCl
Molecular Weight: 36.46

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, light.
Incompatibilities with Other Materials:
Acetate, acetic anhydride, alcohols + hydrogen cyanide, 2-aminoethanol, ammonium hydroxide, calcium carbide, calcium phosphide, cesium acetylene carbide, cesium carbide, chlorosulfonic acid, 1,1-difluoroethylene, ethylene diamine, ethyleneimine, fluorine, lithium silicide, magnesium boride, mercuric sulfate, oleum, perchloric acid, potassium permanganate, b-propiolactone, propylene oxide, rubidium acetylene carbide, rubidium carbide, silver perchlorate + carbon tetrachloride, sodium, sodium hydroxide, sulfuric acid, uranium phosphide, vinyl acetate. Substance polymerizes on contact with aldehydes or epoxides.
Hazardous Decomposition Products:
Hydrogen chloride, hydrogen gas.
Hazardous Polymerization: May occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 7647-01-0: MW4025000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
CAS# 7732-18-5: Oral, rat: LD50 = 90 mL/kg.
CAS# 7732-18-5: Oral, rat: LD50 = 90 mL/kg.
Carcinogenicity:
Hydrogen chloride -
IARC: Group 3 carcinogen
Water -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No information available.
Teratogenicity:
Embryo or Fetus: Stunted fetus, ihl-rat TCLo=450 mg/m3/1H Specific Developmental Abnormalities: homeostasis, ihl-rat TCLo=450 mg/m3/1H.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
None.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Trout LC100=10 mg/L/24H Shrimp LC50=100-330 ppm Starfish LC50=100-330mg/L/48H Shore crab LC50=240 mg/L/48H Chronic plant toxicity=100 ppm
Environmental Fate:
Substance will neutralize soil carbonate-based components.
Physical/Chemical:
No information available.
Other:
None.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants: Not listed.
RCRA D-Series Chronic Toxicity Reference Levels: Not listed.
RCRA F-Series: Not listed.
RCRA P-Series: Not listed.
RCRA U-Series: Not listed.
Not listed as a material banned from land disposal according to RCRA.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: HYDROCHLORIC ACID, SOLUTION
Hazard Class: 8
UN Number: UN1789

Packing Group: II
IMO
No information available.
IATA
No information available.
RID/ADR
No information available.
Canadian TDG
Shipping Name: HYDROCHLORIC ACID
Hazard Class: 8(9.2)
UN Number: UN1789

**** SECTION 15 - REGULATORY INFORMATION ****

FEDERAL
TSCA
CAS# 7647-01-0 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
final RQ = 5000 pounds (2270 kg)
Section 302 (TPQ)
CAS# 7647-01-0: TPQ = 500 pounds
SARA Codes
CAS # 7647-01-0: acute.
Section 313
This material contains Hydrogen chloride (CAS# 7647-01-0, 36-38%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 7647-01-0 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
CAS# 7647-01-0 is considered highly hazardous by OSHA.
STATE
Hydrogen chloride can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
Not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level:
None of the chemicals in this product are listed.
INTERNATIONAL
European Labeling in Accordance with EC Directives
Hazard Symbols: hydrogen gas
Risk Phrases:
Safety Phrases:
S 2 Keep out of reach of children.
S 24/25 Avoid contact with skin and eyes.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 3/9 Keep in a cool, well-ventilated place.
S 28A After contact with skin, wash immediately with plenty of water.
Canada
CAS# 7647-01-0 is listed on Canada's DSL/NDSL List.
CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.
CAS# 7647-01-0 is listed on Canada's Ingredient Disclosure List.
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits:
CAS# 7647-01-0: OEL-AUSTRALIA:TWA 5 ppm (7 mg/m3). OEL-AUSTRIA:TWA 5 ppm (7 mg/m3). OEL-BELGIUM:STEL 5 ppm (7.7 mg/m3). OEL-DENMARK:STEL 5 ppm (7 mg/m3). OEL-FINLAND:STEL 5 ppm (7 mg/m3);Skin. OEL-FRANCE:STEL 5 ppm (7.5 mg/m3). OEL-GERMANY:TWA 5 ppm (7 mg/m3). OEL-HUNGARY:STEL 5 mg/m3. OEL-JAPAN:STEL 5 ppm (7.5 mg/m3). OEL-THE NETHERLANDS:TWA 5 ppm (7 mg/m3). OEL-THE PHILIPPINES:TWA 5 ppm (7 mg/m3). OEL-POLAND:TWA 5 mg/m3. OEL-RUSSIA:STEL 5 ppm (5 mg/m3). OEL-SWEDEN:STEL 5 ppm (8 mg/m3). OEL-SWITZERLAND:TWA 5 ppm (7.5 mg/m3);STEL 10 ppm (15 mg/m3). OEL-THAILAND:TWA 5 ppm (7 mg/m3). OEL-TURKEY:TWA 5 ppm (7 mg/m3). OEL-UNITED KINGDOM:TWA 5 ppm (7 mg/m3);STEL 5 ppm (7 mg/m3). OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV. OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

Additional Information:
No additional information available.
MSDS Creation Date: 1/09/1995 Revision #10 Date: 2/07/1997

National Sanitation Foundation (NSF) Requirements

NSF 60 addresses drinking water treatment Chemicals

NSF 61 addresses drinking water system components

AN OVERVIEW OF THE SDWA REGULATIONS; *QUESTIONS…?*

NMWWA Short School
OHKAY/Casino Conference Center
Wednesday 15 May 2024
10.40-11.50a

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