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Summary of Massachusetts Drinking Water Program Testing Requirements for Public Water Systems

This fact sheet summarizes drinking water testing requirements, maximum contaminant levels (MCLs), and Maximum Residual Disinfectant Levels (MRDLs) in the State of Massachusetts. These MCLs, MRDLs, and drinking water standards have been established by the U.S. Environmental Protection Agency or the State of Massachusetts for the protection of the public health.

These requirements apply to all public water systems in the state - systems serving drinking water to at least 25 individuals (or 15 service connections) at least 60 days of the year. There are two main types of public water systems:

- ***Community Water Systems*** - primarily serve year-round residents; and
- ***Non-Community Systems*** - serve water to non-residential customers and may include restaurants, factories, schools and hospitals.

Non-community systems that regularly serve at least 25 of the same people, for approximately four or more hours a day, four or more days per week, for more than six months or 180 days of the year are called ***Non-Transient Non-Community Water Systems*** (NTNCs) and are regulated more stringently than ***Transient Non-Community Water Systems*** (TNCs).

The standards listed apply to water, which is delivered to the user's tap. Most samples are collected from the point of entry to the distribution system (after any treatment); however, some measurements including those for disinfectants, some disinfection byproducts (trihalomethanes and haloacetic acids), bacteria, lead and copper are conducted out in the distribution system. For lead and copper, the MCL has been replaced with an "action level" and is measured at the consumer's tap.

Determining compliance with these standards differs with each contaminant. The regulations and the individual system's approved sampling plan must be consulted for more specific information. In certain cases, MassDEP may require more frequent testing than specified.

MassDEP also utilizes health-based guidance numbers for chemicals for which standards have not been established. These are determined by the MassDEP Office of Research and Standards (ORS) and applied on a case-by-case basis. The list of guidance values (ORSG) is updated periodically.

Also included is a list of the federal and state secondary contaminant levels. These are aesthetic standards, but they may be enforced on a case-by-case basis.

Copies of the Massachusetts Drinking Water Regulations, 310 CMR 22.00, are available at https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations. If you have any questions on this information, please contact the MassDEP Drinking Water Program at 617-292-5770, or Program.Director-DWP@mass.gov.

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This information is available in alternate format by calling our ADA Coordinator at 617-292-5751.

Inorganic Compounds

Parameter	CASRN*	MCL	Monitoring Requirements
Antimony	7440360	0.006 mg/l	Monitoring frequency depends on MassDEP-approved sampling plan. Community and non-transient non-community water supply sources monitoring frequency ranges from once per year for surface water sources to once every three years for groundwater sources. Non-vulnerable sources may be granted waivers and sample once every nine years.
Arsenic	7440382	0.010 mg/l	
Asbestos[1]	1332214	7 million fibers/l	
Barium	7440393	2 mg/l	
Beryllium	7440417	0.004 mg/l	
Cadmium	7440439	0.005 mg/l	
Chromium	7440473	0.1 mg/l	
Cyanide	57125	0.2 mg/l	
Fluoride[2]	7782414	4.0 mg/l	
Lead (action level)	7439921	0.015 mg/l	
Copper (action level)	7440508	1.3 mg/l	
Mercury	7439976	0.002 mg/l	
Nickel[4]	7440020	N/A	[1]Statewide monitoring waivers have been approved by the U.S. EPA for source waters.
Nitrate (as N)[3]	14797558	10 mg/l	[2]There is also a secondary MCL for fluoride which is 2.0 mg/l.
Nitrite (as N)[3]	14797650	1 mg/l	[3]Transient Non-Community systems (TNC) are required to monitor for these contaminants.
Total Nitrate & Nitrite (as N)	--	10 mg/l	[4]Although Nickel does not have an MCL, monitoring is required.
Perchlorate	14797730	0.0020 mg/l	
Selenium	7782492	0.05 mg/l	
Sodium[3]	7440235	N/A	
Thallium	7440280	0.002 mg/l	

Volatile Organic Compounds

Parameter	CASRN	MCL	Monitoring Requirements
Benzene	71432	0.005 mg/l	Monitoring frequency depends on MassDEP–approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters every three years. Waivers may be granted to non-vulnerable sources to monitor once every three years.
Carbon tetrachloride	56235	0.005 mg/l	
Dichloromethane	75092	0.005 mg/l	
1,2-Dichlorobenzene (o-DCB)	95501	0.6 mg/l	
1,4-Dichlorobenzene (p-DCB)	106467	0.005 mg/l	
1,2-Dichloroethane	107062	0.005 mg/l	
cis-1,2-Dichloroethylene	156592	0.07 mg/l	
Trans-1,2-Dichloroethylene	156605	0.1 mg/l	
1,1-Dichloroethylene	75354	0.007 mg/l	
1,2-Dichloropropane	78875	0.005 mg/l	[5]MtBE has an ORSG not an MCL
Ethylbenzene	100414	0.7 mg/l	
Methyl tert-Butyl Ether (MtBE)[5]	1634044	0.07 mg/l[5]	
Monochlorobenzene	108907	0.1 mg/l	
Styrene	100425	0.1 mg/l	
Tetrachloroethylene	127184	0.005 mg/l	
Toluene	108883	1 mg/l	
Trichloroethylene	79016	0.005 mg/l	
1,1,1-Trichloroethane	71556	0.2 mg/l	
1,2,4-Trichlorobenzene	120821	0.07 mg/l	
1,1,2-Trichloroethane	79005	0.005 mg/l	
Vinyl Chloride	75014	0.002 mg/l	
Xylenes (total)	1330207	10 mg/l	

* Chemical Abstract Service Registry Number

Synthetic Organic Compounds

Parameter	CASRN	MCL	Monitoring Requirements
Alachlor	15972608	0.002 mg/l	Monitoring frequency depends on MassDEP–approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters. Non-vulnerable sources may be granted monitoring waivers.
Atrazine	1912249	0.003 mg/l	
Benzo(a)pyrene	50328	0.0002 mg/l	
Carbofuran	1563662	0.04 mg/l	
Chlordane	57749	0.002 mg/l	
Dalapon	75990	0.2 mg/l	
Di(2-ethylhexyl) adipate	103231	0.4 mg/l	
Di(2-ethylhexyl) phthalate	117817	0.006 mg/l	
Dinoseb	88857	0.007 mg/l	
Diquat[6]	85007	0.02 mg/l	[6]Statewide waivers have been approved by the U.S. EPA for both ground and surface waters. [7]Transient Non-Community PWS also are initially required to collect one sample at each entry point to the distribution system. [8] CASRN #s PFOS 1763-23-1, PFOA 335-67-1, PFHxS 355-46-4, PFNA 375-95-1, PFHpA 375-85-9, and PFDA 335-76-2 [9]Statewide waivers have been approved by the U.S. EPA for surface waters.
1,2-Dibromo-3-chloropropane (DBCP)[9]	96128	0.0002 mg/l	
2,4-D (2,4-Dichlorophenoxyacetic acid)	94757	0.07 mg/l	
Endothall[6]	145733	0.1 mg/l	
Endrin	722080	0.002 mg/l	
Ethylene dibromide (EDB)[9]	106934	0.00002 mg/l	
Glyphosate[6]	1071536	0.7 mg/l	
Heptachlor	76448	0.0004 mg/l	
Heptachlor epoxide	1024573	0.0002 mg/l	
Hexachlorobenzene	118741	0.001 mg/l	
Hexachlorocyclopentadiene	77474	0.05 mg/l	
Lindane	58899	0.0002 mg/l	
Methoxychlor	72435	0.04 mg/l	
Oxamyl (Vydate)	23135220	0.2 mg/l	
Polychlorinated biphenyls (PCBs)	1336363	0.0005 mg/l	
Pentachlorophenol	87865	0.001 mg/l	
Picloram	1918021	0.5 mg/l	
PFAS6[7]	multiple[8]	0.000020 mg/l	
Simazine	122349	0.004 mg/l	
2,3,7,8-TCDD (Dioxin)[6]	1746016	$3x10^{-8}$ mg/l	
Toxaphene	8001352	0.003 mg/l	
2,4,5-TP (Silvex)	93721	0.05 mg/l	

Turbidity

Parameter	MCL	Monitoring Requirements
Turbidity	1 NTU (Nephelolometric turbidity unit)	Applies to Community and Non-community systems using filtered or unfiltered surface water sources. Monitoring is required daily. Non-community systems may reduce sampling if MassDEP approval is granted to do so.

Disinfectants/Disinfection Byproducts

Parameter	CASRN	MCL	Monitoring Requirements
Chlorine (as Cl_2)	7782505	4.0 mg/l	Monitoring frequency depends on MassDEP–approved sampling plan and type of treatment being used. Applies to Community and non-transient non-community systems which add a chemical disinfectant (oxidant) to the water.
Chloramines (as Cl_2)	--	4.0 mg/l	
Chlorine dioxide (as ClO_2)[10]	10049044	0.8 mg/l	
Total Trihalomethanes:		0.080 mg/l	
chloroform	67663		
bromodichloromethane	75274		
dibromochloromethane	124481		
bromoform	75252		
Haloacetic Acids (five):		0.060 mg/l	
monochloroacetic acid	79118		
dichloroacetic acid	79436		
trichloroacetic acid	76039		
monobromoacetic acid	79083		
dibromoacetic acid	631641		
Bromate	15541454	0.010 mg/l	
Chlorite	7758192	1.0 mg/l	

[10]Also applies to Transient non-community (TNC) systems.

Bacteria

Parameter and MCL	Monitoring Requirements
Revised Total Coliform Rule (RTCR) Total Coliform – no MCL	Applies to all systems. The number of samples collected depends on the population served (see 310 CMR 22.05, Table 1). The range is from 1/month for systems serving ≤ 1,000 persons to 480/month for systems serving > 3,960,000. Non-community systems must sample no less than quarterly.
E. coli, MCL 1. An *E. coli*-positive repeat sample following an associated Total Coliform-positive routine sample, or 2. A Total Coliform-positive repeat sample following an *E. coli*-positive routine sample, or 3. A system fails to collect all required repeat samples following an *E. coli*-positive routine sample, or 4. A system fails to test for *E. coli* when any repeat sample tests positive for Total Coliform	*E. coli* testing is required of any routine or repeat sample that is Total Coliform-positive.
Ground Water Rule (GWR) Fecal indicators – *E coli*, enterococci, and coliphage (See 310 CMR 22.26(3)(a)3 to determine the applicable fecal indicator for your system)	Applies to all systems with ground water sources that do not have MassDEP certified 4-log treatment. Source monitoring is *triggered* if the system has a Total Coliform-positive distribution sample. One (1) raw water sample is required for each of the ground water sources in use at the time of the Total Coliform-positive result. *Representative sampling may be allowed with prior MassDEP approval.* If the initial source sample(s) is positive 5 additional source samples are required.

Radionuclides

Parameter	CASRN	MCL	Monitoring Requirements
Gross Alpha Particle Activity[11]	--	15 pCi/l	Community systems must monitor for 4 consecutive quarters prior to December 31, 2007. Use of previously collected data or no detections during the first two quarters may reduce this requirement. Future monitoring requirements are based on the results of this initial period.
Combined Radium-226[12] and Radium-228	7440144	5 pCi/l	
Uranium[12]	7440611	30 ug/l	
Beta Particle Activity[13]	--	4 mrem/yr	
Photon Radioactivity[13]	--	4 mrem/yr	
Average Annual Concentrations which produces a body or organ dose of 4 mrem/yr			
Tritium	10028178	20,000 pCi/l	
Strontium-90	10098972	8 pCi/l	

[11]Includes radium-226 but excludes radon and uranium.

[12]If the gross alpha particle activity is ≤ 5 pCi/l, it may be substituted for the required radium-226 analysis. If the gross alpha particle activity is ≤ 15 pCi/l, it may be substituted for the required uranium analysis.

[13]Monitoring is required only at those systems designated by MassDEP.

Massachusetts Drinking Water Guidelines

This list of public water supply guidelines is for chemicals that do not have MCLs/MRDLs. MassDEP's Office of Research and Standards (ORS) derives these guidelines and adopts or revises U.S. EPA health advisories and proposed MCLs. New guidelines are evaluated on a case-by-case, ongoing basis and may be incorporated into the list at any time.

For information on the derivation of the guidelines, and for general information on the health effects of water contaminants, please contact ORS at 617-292-5570 or visit https://www.mass.gov/guides/drinking-water-standards-and-guidelines#-guidelines-.

Parameter	CASRN	Guideline (mg/l)	Monitoring Requirements
Acetone	67641	6.3	On a case-by-case basis MassDEP may require systems to monitor for one or more of these chemicals.
Aldicarb	116063	0.003	
Aldicarb sulfone	1646884	0.002	
Aldicarb sulfoxide	1646873	0.004	
Bromomethane	74839	0.01	
Chloroform[14]	67663	0.07	
Dichlorodifluoromethane	75718	1.4	
1,1-Dichloroethane	75343	0.07	
1,3-Dichloropropene	542756	0.0004	
1,4-Dioxane	123911	0.003	
Ethylene glycol	107211	14	
Manganese	7439965	0.3[18,19] 1.0[20]	
Methyl ethyl ketone	78933	4.0	
Methyl isobutyl ketone	108101	0.35	
Methyl tertiary-Butyl Ether	1634044	0.07	
Metolachlor	51218452	0.1	
Naphthalene	91203	0.140	
Nickel	7440020	0.1	
Petroleum Hydrocarbons			
TPH (Total petroleum hydrocarbons)	N/A	0.2	
Aliphatics C5-C8	N/A	0.3	
Aliphatics C9-C12[15]	N/A	0.7	
Aliphatics C9-C18[15]	N/A	0.7	
Aliphatics C19-C36	N/A	14.0	
Aromatics C9-C10	N/A	0.2	
Aromatics C11-C22	N/A	0.2	
Radon-222[16]	14859677	10,000 pCi/l	
Sodium[17]	7440235	20	
Tetrahydrofuran	109999	0.6	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	76131	210	
Tertiary Amyl Methyl Ether (TAME)	994058	0.09	
Tertiary Butyl Alcohol (TBA)	75650	0.12	

[14] Non-chlorinated supplies only.

[15] The overlap in the C9-C12 range is the result of the VPH and EPH analytical methods used to quantitate these ranges of petroleum hydrocarbons in drinking water. The choice of the most appropriate range to use is based on the identity of the petroleum product of concern and is therefore determined on a case-specific basis.

[16] EPA has proposed an MCL of 300 pCi/l.

[17] The sodium guideline is based on an 8-ounce serving.

[18] General Population: lifetime

[19] Infants < 1 year old: 10-day

[20] General Population: 10-day

Massachusetts Secondary Standards

Massachusetts has secondary standards for drinking water. The parameters listed below are not known to cause a health risk at or below the secondary standard, but may affect the taste, color, and/or odor of drinking water.

Parameter	CASRN	Secondary MCL (mg/l)	Monitoring Requirements
Aluminum	7429905	0.05 to 0.2	Secondary standards are used to determine aesthetic quality and enhance water operations as such MassDEP strongly recommends that systems annually monitor for all secondary standards. On a case by case basis MassDEP may require systems to monitor for secondary standards.
Chloride	7647145	250	
Color	N/A	15 color units	
Copper	7440508	1	
Corrosivity	N/A	Non-corrosive	
Fluoride	7782414	2.0	
Foaming agents	N/A	0.5	
Iron	7439896	0.3	
Manganese	7439965	0.05	
Methyl tertiary-Butyl Ether[18]	1634044	0.020 – 0.040	
Odor	N/A	3 threshold odor numbers	
pH	N/A	6.5 to 8.5	
Silver	7440224	0.10	
Sulfate[19]	7757826	250	
Total dissolved solids (TDS)	N/A	500	
Zinc	7440666	5	

[18]Based on EPA's Drinking Water Advisory using taste and odor thresholds.
[19]EPA has proposed an MCL of 500 mg/l.