

Primary, Secondary, Disinfectant & Microbiological Standards

Legend	Contaminant	Potential Health Effects	Common Sources	MCL	DLR	PHG	Method
Chemicals with MCLs in 22 CCR §64431 - Inorganic Chemicals (IOC)							
IOC	Aluminum (Al)	Irritation to eyes, skin and respiratory system	Industrial runoff; acid rain	1000µg/l	50µg/l	600µg/l	EPA200.8
IOC	Antimony (Sb)	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	6	6	20	200.8
IOC	Arsenic (As)	Skin damage or problems with circulatory systems, and may increase risk of cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	10	2	0.004	200.8
IOC	Asbestos	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7MFL	0.2MFL	7MFL	100.2
IOC	Barium (Ba)	Increase in blood pressure	Discharge of drilling wastes; discharge from drilling refineries; erosion of natural deposits	1000µg/l	100µg/l	2000µg/l	200.8
IOC	Beryllium (Be)	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	4	1	1	200.8
IOC	Cadmium (Cd)	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	5	1	0.04	200.8
IOC	Chromium (Cr)	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	50	10	NA	200.8
IOC	Chromium 6 (Cr6)	Leukocytosis; Leukopenia; Eosinophilia	Discharge from tanning and painting industry	10	1	NA	218.6
IOC	Cyanide (CN)	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	150	100	15	SM4500
IOC	Fluoride (F)	Bone disease (pain and tenderness of the bones); children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	2mg/l	0.1mg/l	1mg/l	EPA300.0
IOC	Mercury (Hg)	Kidney damage	Erosion of natural deposits; discharge from refineries; runoff from landfills and croplands	2µg/l	1µg/l	1.2µg/l	245.1
IOC	Nickel (Ni)	Sensitization dermatitis; allergic asthma; pneumonitis	Discharge from power plants, waste incinerators and metal industries	100	10	12	200.8

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Chemicals with MCLs in 22 CCR §64431 - Inorganic Chemicals (IOC) continued							
IOC	Nitrate (as NO ₃)	Infants below the age of six months who drink water containing nitrate in excess of the MCL run the risk of becoming seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	45mg/l	2mg/l	45mg/l	300.0
IOC	Nitrite (as N)	Infants below the age of six months who drink water containing nitrite in excess of the MCL run the risk of becoming seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1 as N	0.4	1 as N	300.0
IOC	Nitrate + Nitrite	NA	NA	10 as N	NA	10 as N	Calculation
IOC	Perchlorate	Thyroid damage	By-product of rocket propellant, explosives and firework production	6µg/l	4µg/l	6µg/l	314.0
IOC	Selenium (Se)	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines	50	5	NA	200.8
IOC	Thallium (Tl)	Hair loss; changes in blood; kidney, intestine or liver problems	Leaching from ore processing sites; discharge from electronics, glass and drug factories	2	1	0.1	200.8
Copper and Lead, 22 CCR §64672.3 - Inorganic Chemicals (IOC)							
IOC	Copper (Cu)	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor should the amount of copper in their water exceed the action level	Corrosion of household plumbing systems; erosion of natural deposits	1,300	50	300	200.8
IOC	Lead (Pb)	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	15	5	0.2	200.8
Radionuclides with MCLs in 22 CCR §64441 - Radioactivity (R)							
R	Gross Alpha	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	15pCi/L	3pCi/L	NA	900.0
R	Gross Beta	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as photons and beta radiation	4 mrem/yr	4	NA	900.0
R	Radium-226	Increased risk of cancer	Erosion of natural deposits	NA	1	0.05	903
R	Radium-228	Increased risk of cancer	Erosion of natural deposits	NA	1	0.019	904

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Radionuclides with MCLs in 22 CCR §64441 - Radioactivity (R) continued							
R	Radium-226 & 228	Increased risk of cancer	Erosion of natural deposits	5	NA	NA	903/904
R	Strontium 90	Disrupts infant hormonal development and growth	Above ground nuclear testing (1950's)	8	2	0.35	905
R	Tritium	Radiation hazard when ingested	Above ground nuclear testing (1950's)	20,000	1,000	400	906
R	Uranium	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	20	1	0.43	908
Volatile Organic Chemicals with MCLs in 22 CCR §64444 - (a) VOCs (OC)							
VOC	Benzene	Anemia; decrease in blood platelets; increased risk in cancer	Discharge from factories; leaching from gas storage tanks and landfills	1µg/l	0.5µg/l	0.15µg/l	524.2
VOC	Carbon tetrachloride	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	0.5	0.5	0.1	524.2
VOC	1,2-Dichlorobenzene	Liver, kidney or other circulatory problems	Discharge from industrial chemical factories	600	0.5	600	524.2
VOC	1,4-Dichlorobenzene	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	5	0.5	6	524.2
VOC	1,1-Dichloroethane	Liver, kidney and lung damage	Discharge from industrial chemical factories	5	0.5	3	524.2
VOC	1,2-Dichloroethane	Increased risk of cancer	Discharge from industrial chemical factories	0.5	0.5	0.4	524.2
VOC	1,1-Dichloroethene	Liver problems	Discharge from industrial chemical factories	6	0.5	10	524.2
VOC	cis-1,2-Dichloroethene	Liver problems	Discharge from industrial chemical factories	6	0.5	100	524.2
VOC	trans-1,2-dichloroethene	Liver problems	Discharge from industrial chemical factories	10	0.5	60	524.2
VOC	Methylene chloride	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	5	0.5	4	524.2
VOC	1,2-Dichloropropane	Liver problems	Discharge from industrial chemical factories	5	0.5	0.5	524.2
VOC	1,3-Dichloropropene	Liver or kidney problems	Discharge from industrial chemical factories	0.5	0.5	0.2	524.2
VOC	Ethylbenzene	Liver or kidney problems	Discharge from petroleum refineries	300	0.5	300	524.2
VOC	Methyl tertiary butyl ether	Nose, throat and gastro-intestinal problems	Gasoline (additive) leaks: tanks, engines	13	3	13	524.2
VOC	Monochlorobenzene	Liver and central nervous system problems	Herbicide, dyestuff and rubber production	70	0.5	200	524.2
VOC	Styrene	Liver, kidney or circulatory problems	Discharge from rubber and plastic factories; leaching from landfills	100	0.5	0.5	524.2

Legend	Contaminant	Potential Health Effects	Common Sources	MCL	DLR	PHG	Method
Volatile Organic Chemicals with MCLs in 22 CCR §64444 - (a) VOCs (OC) continued							
VOC	1,1,2,2-Tetrachloroethane	Hepatitis; Leukocytosis	Banned chemical: hazardous waste sites	1µg/l	0.5µg/l	0.1µg/l	524.2
VOC	Tetrachloroethene	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	5	0.5	0.06	524.2
VOC	Toluene	Nervous system, kidney or liver problems	Discharge from petroleum factories	150	0.5	150	524.2
VOC	1,2,4-Trichlorobenzene	Changes in adrenal glands	Discharge from textile finishing factories	5	0.5	5	524.2
VOC	1,1,1-Trichloroethane	Liver, nervous system or circulatory problems	Discharge from metal degreasing sites and other factories	200	0.5	1,000	524.2
VOC	1,1,2-Trichloroethane	Liver, kidney or immune system problems	Discharge from industrial chemical factories	5	0.5	0.3	524.2
VOC	Trichloroethylene	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	5	0.5	0.8	524.2
VOC	Trichlorofluoromethane	Cardiac arrhythmias	Discharge from refrigerant applications	150	5	700	524.2
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	Central nervous system and cardiovascular system problems	Degreasing and drying applications, as a refrigerant or cutting fluid	1,200	10	4,000	524.2
VOC	Vinyl chloride	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	0.5	0.5	0.05	524.2
VOC	Xylenes	Nervous system damage	Discharge from petroleum and chemical factories	1,750	0.5	1,800	524.2
Non-Volatile Synthetic Organic Chemicals with MCLs in 22 CCR §64444 - (b) SOCs (OC)							
SOC	Alachlor	Eye, liver, kidney or spleen problems; anemia	Runoff from herbicide on row crops	2	1	4	507
SOC	Atrazine	Cardiovascular or reproductive problems	Runoff from herbicide on row crops	1	0.5	0.15	507
SOC	Bentazon	Increased risk of cancer	Runoff from herbicide use	18	2	200	515.1
SOC	Benzo(a)pyrene	Reproductive difficulties; increased risk of cancer	Leaching from the linings of water storage tanks and distribution lines	0.2	0.1	0.004	525.2
SOC	Carbofuran	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	18	5	1.7	531.1
SOC	Chlordane	Liver or nervous system problems; cancer risk	Residue of banned termiticide	0.1	0.1	0.03	508
SOC	Dalapon	Minor kidney changes	Runoff from herbicide used on rights of way	200	10	790	515.1
SOC	1,2-Dibromo-3-chloropropane (DBCP)	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, orchards	0.2	0.01	0.0017	504.1

Legend	Contaminant	Potential Health Effects	Common Sources	MCL	DLR	PHG	Method
Non-Volatile Synthetic Organic Chemicals with MCLs in 22 CCR §64444 - SOCs (OC) continued							
SOC	2,4-D	Kidney, liver or adrenal gland problems	Runoff from herbicide on row crops	70µg/l	10µg/l	20µg/l	515.1
SOC	Di(2-ethylhexyl)adipate	Weight loss; liver problems	Discharge from chemical factories	400	5	200	525.2
SOC	Di(2-ethylhexyl)phthalate (DEHP)	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	4	3	12	525.2
SOC	Dinoseb	Reproductive difficulties	Runoff from soybean and vegetable herbicide use	7	2	14	515.1
SOC	Diquat	Cataracts	Runoff from herbicide use	20	4	15	549.2
SOC	Endothall	Stomach and intestinal problems	Runoff from herbicide use	100	45	580	548.1
SOC	Endrin	Liver problems	Residue of banned insecticide	2	0.1	1.8	508
SOC	Ethylene dibromide (EDB)	Problems with liver, stomach, reproductive system or kidneys; increased risk of cancer	Discharge from petroleum refineries	0.05	0.02	0.01	504.1
SOC	Glyphosate	Kidney problems; reproductive difficulties	Runoff from herbicide use	700	25	900	547
SOC	Heptachlor	Liver damage; increased risk of cancer	Residue of banned termiticide	0.01	0.01	0.008	508
SOC	Heptachlor epoxide	Liver damage; increased risk of cancer	Breakdown of Heptachlor	0.01	0.01	0.006	508
SOC	Hexachlorobenzene	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	1	0.5	0.003	508
SOC	Hexachlorocyclopentadiene	Kidney or stomach problems	Discharge from chemical factories	50	1	50	508
SOC	Lindane	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, and gardens	0.2	0.2	0.032	508
SOC	Methoxychlor	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa and cattle	30	10	30	508
SOC	Molinate	Potential reproductive difficulties	Herbicide runoff	20	2	1	507
SOC	Oxamyl	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes and tomatoes	50	20	26	531.1
SOC	Pentachlorophenol	Liver or kidney problems; increased risk of cancer	Discharge from wood preserving factories	1	0.2	0.3	515.1
SOC	Picloram	Liver problems	Herbicide runoff	500	1	500	515.1

Legend	Contaminant	Potential Health Effects	Common Sources	MCL	DLR	PHG	Method
Non-Volatile Synthetic Organic Chemicals with MCLs in 22 CCR §64444 - SOCs (OC) continued							
SOC	Polychlorinated biphenyls (PCB's)	Skin changes; thymus gland problems; immune deficiencies; reproductive and nervous system difficulties; increase risk of cancer	Runoff from landfills; discharge from waste chemicals	0.5µg/l	0.5µg/l	0.09µg/l	508
SOC	Simazine	Problems with blood	Herbicide runoff	4	4	4	507
SOC	2,4,5-TP (Silvex)	Liver problems	Residue of banned herbicide	50	1	25	515.1
SOC	2,3,7,8,TCDD (Dioxin)	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	3x10 ⁻⁸	5x10 ⁻⁹	1x10 ⁻⁹	1613
SOC	Thiobencarb	Potential endocrine system disruption	Herbicide runoff	70	1	70	507
SOC	Toxaphene	Central nervous system and skin damage	Banned insecticide runoff	3	1	0.03	508
Disinfectant By-product Chemicals with MCLs in 22 CCR §64533 - DBPs (DBP)							
DBP	Bromate	Increased risk of cancer	Byproduct of drinking water disinfection	10	5	0.1	326.0
DBP	Chlorite	Anemia; infants and young children: nervous system effects	Byproduct of drinking water disinfection	1000	20	50	300.1
DBP	Total Trihalomethanes	Liver, kidney and central nervous system problems	Byproduct of drinking water disinfection	80	1	NA	524.2
DBP	Haloacetic acids	Increased risk of cancer	Byproduct of drinking water disinfection	60	1 to 2	NA	552.2
Secondary Standards with MCLs in 22 CCR §64449 - Group A (SS-A)							
SS-A	Color	Visible tint in drinking water	Suspended inorganic and organic matter	15 units	NA	NA	SM2120B
SS-A	Copper (Cu)	See lead & copper rule above	See lead & copper rule above	1.3mg/l	0.05mg/l	0.3mg/l	EPA200.8
SS-A	Foaming Agents	Bitter taste and odor of water	Detergents	0.5	NA	NA	SM5520C
SS-A	Iron (Fe)	High concentrations affect internal organs	Natural weathering and industrial discharge	0.3	NA	NA	EPA200.8
SS-A	Manganese (Mn)	Dry throat and cough; kidney damage	Erosion of soil	0.05	NA	NA	200.8
SS-A	Odor - Threshold	Musty, chemical or "rotten egg" odor of water	Water treatment deficiencies	3 units	NA	NA	140.1
SS-A	Silver (Ag)	Skin discoloration; nose and throat irritation	Metal refinery, photo processing discharge	0.1mg/l	NA	NA	200.8
SS-A	Turbidity	High levels correlate to poor water quality	Natural sediments, erosion, storm runoff	5 units	NA	NA	SM2310B
SS-A	Zinc (Zn)	Metallic taste of water	Discharge from galvanic and battery industry	5mg/l	NA	NA	EPA200.8

Legend	Contaminant	Potential Health Effects	Common Sources	MCL	DLR	PHG	Method
Secondary Standards with MCLs in 22 CCR §64449 - Group B (SS-B)							
SS-B	Total Dissolved Solids	Aesthetic effects; indicator of hardness	Suspended inorganic and organic matter	500mg/l	NA	NA	SM2540C
SS-B	Conductivity	Aesthetic effects only	Dissolved solids in water	900µS/cm	NA	NA	SM2510B
SS-B	Chloride	Potential hypertension in high concentrations	Natural runoff and industrial effluents	250mg/l	NA	NA	EPA300
SS-B	Sulfate	Laxative side effects in high concentrations	Occurs naturally in drinking water	250	NA	NA	300.0

Microorganisms with MCL & PHG in 22 CCR §64426.1

M	Cryptosporidium	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	Zero	<0.1cfu/L	Zero	1622/ 1623LT2
M	Giardia lamblia	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	Zero	<0.1cfu/L	Zero	1623LT2
M	Heterotrophic Plate Count (HPC)	HPC has no health effects; it is an analytic method to measure the variety of bacteria in water. The lower the concentration, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	<500cfu/l	1.0cfu/L	NA	SM9215B
M	Legionella	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	Zero	0.03cfu/MI	Zero	9260J
M	Total Coliforms (including fecal coliform & E.coli)	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present	Coliforms are naturally present in the environment as well as feces; fecal coliforms and E.coli only come from human and animal fecal waste	Zero	1cfu/100MI	Zero	9223
M	Viruses (enteric)	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	Zero	1pfu/L	Zero	9510(m)

Legend			
IOC	Inorganic Chemicals	DBP	Disinfectant By-products
R	Radionuclides	SS-A	Secondary Standards Group "A"
VOC	Volatile Organic Chemicals	SS-B	Secondary Standards Group "B"
SOC	Synthetic Organic Chemicals	M	Microorganisms



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