



## National Recommended Water Quality Criteria - Aquatic Life Criteria Table

Aquatic life criteria for toxic chemicals are the highest concentration of specific pollutants or parameters in water that are not expected to pose a significant risk to the majority of species in a given environment or a narrative description of the desired conditions of a water body being "free from" certain negative conditions. The table below lists EPA's recommended aquatic life criteria. State and tribal governments may use these criteria or use them as guidance in developing their own.

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## National Recommended Aquatic Life Criteria table

Pollutant (P = Priority Pollutant)	CAS (Chemical Abstracts Service) Number	Aquatic Life Criteria				Publication Year	Notes
		Freshwater CMC (Criteria Maximum Concentration) <sup>1</sup> (acute) (µg/L)	Freshwater CCC (Criterion Continuous Concentration) <sup>2</sup> (chronic) (µg/L)	Saltwater CMC (Criteria Maximum Concentration) <sup>1</sup> (acute) (µg/L)	Saltwater CCC (Criterion Continuous Concentration) <sup>2</sup> (chronic) (µg/L)		
Acrolein (P)	107028	3ug/L	3ug/L	—	—	2009	
Aesthetic Qualities	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
							These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If

Aldrin (P)	309002	3.0	—	1.3	—	1980	1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
Alkalinity	—	—	20000	—	—	1986	The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.
alpha-Endosulfan (P)	959988	0.22	0.056	0.034	0.0087	1980	These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

This value was derived

								This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.
Aluminum pH 6.5 – 9.0	7429905	750	87	—	—	1988		This value for aluminum is expressed in terms of total recoverable metal in the water column.
Ammonia	7664417	—	—	—	—	2013 (Freshwater), 1989 (Saltwater)		Freshwater criteria are pH, temperature and life-stage dependent. Saltwater criteria are pH and temperature dependent.
Arsenic	7440382	340	150	69	36	1995		This recommended water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic.  Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.
Atrazine	1912249							

See Quality Criteria

Bacteria	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
beta-Endosulfan (P)	33213659	0.22	0.056	0.034	0.0087	1980	<p>These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.</p> <p>This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.</p>
Boron	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
							Freshwater acute and chronic criteria are hardness-dependent and were normalized

Cadmium (P)	7440439	1.8	0.72	33	7.9	2016	and were normalized to a hardness of 100 mg/L as CaCO <sub>3</sub> to allow the presentation of representative criteria values. .  Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.
Carbaryl	63252	2.1	2.1	1.6	—	2012	
Chlordane (P)	57749	2.4	0.0043	0.09	0.004	1980	These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
Chloride	16887006	860000	230000	—	—	1986	
Chlorine	7782505	10	11	12	7.5	1986	

Contaminant	CAS No.	17	11	15	15	1780	
Chloropyrifos	2921882	0.083	0.041	0.011	0.0056	1986	
Chromium (III) (P)	16065831	570	74	—	—	1995	<p>Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.</p> <p>The freshwater criterion for this metal is expressed as a function of hardness (mg/L). The value given here corresponds to a hardness of 100 mg/L.</p>
Chromium (VI) (P)	18540299	16	11	1,100	50	1995	<p>Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.</p>
Color	—	—	—	—	—	1986	<p>See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement</p>

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Copper (P)	7440508	—	—	4.8	3.1	2007	<p>Freshwater criteria calculated using the Biotic Ligand Model.</p> <p>Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.</p>
Cyanide (P)	57125	22	5.2	1	1	1985	These recommended water quality criteria are expressed as µg free cyanide (CN/L).
Demeton	8065483	—	0.1	—	0.1	1985	
Diazinon	333415	0.17ug/L	0.17ug/L	0.82ug/L	0.82ug/L	2005	
Dieldrin (P)	60571	0.24	0.056	0.71	0.0019	1995	<p>The freshwater CCC criterion and both Saltwater criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be</p>

							given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
Endrin (P)	72208	0.086	0.036	0.037	0.0023	1995	The derivation of the CCC for this pollutant did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels.
gamma-BHC (Lindane) (P)	58899	0.95	—	0.16	—	1995	The Saltwater CCC criterion is based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
Gases, Total Dissolved	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
							The CCC of 20mg/L is a minimum value except where



Guthion	86500	—	0.01	—	0.01	1986	EXCEPT WHERE alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.
Hardness	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
Heptachlor (P)	76448	0.52	0.0038	0.053	0.0036	1980	These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.
							These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done using an averaging period, the acute criteria values

Heptachlor Epoxide (P)	1024573	0.52	0.0038	0.053	0.0036	1981	<p>acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.</p> <p>This value was derived from data for heptachlor and there was insufficient data to determine relative toxicities of heptachlor and heptachlor epoxide.</p>
Iron	7439896	—	1000	—	—	1986	<p>The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.</p>
Lead (P)	7439921	65	2.5	210	8.1	1980	<p>Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.</p>

The freshwater

							The freshwater criterion for this metal is expressed as a function of hardness (mg/L). The value given here corresponds to a hardness of 100 mg/L.
Malathion	121755	—	0.1	—	0.1	1986	The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.
Mercury Methylmercury (P)	7439976 22967926	1.4	0.77	1.8	0.94	1995	Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.
Methoxychlor	72435	—	0.03	—	0.03	1986	The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.
Methyl Tertiary-Butyl Ether (MTBE)							

CERCLA (MIRL)							
Mirex	2385855	—	0.001	—	0.001	1986	<p>The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.</p>
Nickel (P)	7440020	470	52	74	8.2	1995	<p>Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. See Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria.</p> <p>The freshwater criterion for this metal is expressed as a function of hardness (mg/L). The value given here corresponds to a hardness of 100 mg/L.</p>
Nonylphenol	84852153	28 ug/L	6.6 ug/L	7 ug/L	1.7 ug/L	2005	
Nutrients	—	—	—	—	—	—	<p>See EPA's Ecoregional criteria for Total Phosphorus, Total Nitrogen, Chlorophyll <i>a</i> and Water Clarity (Secchi depth for lakes:</p>

							depth for lakes, turbidity for streams and rivers) (& Level III Ecoregional criteria)
Oil and Grease	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
Oxygen, Dissolved Freshwater Oxygen, Dissolved Saltwater	7782447	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for freshwater. For saltwater, see Aquatic Life Criteria for Dissolved Oxygen (Saltwater) Cape Cod to Cape Hatteras.
Parathion	56382	0.065	0.013	—	—	1995	
Pentachlorophenol (P)	87865	19	15	13	7.9	1995	Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH and values displayed in table correspond to a pH of 7.8.
							The CCC of 20mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25% of the natural level.  For open ocean waters where the depth is substantially greater than the euphotic zone

pH	---	---	6.5 – 9	---	6.5 – 8.5	1986	than the euphotic zone, the pH should not be changed more than 0.2 units from the naturally occurring variation or any case outside the range of 6.5 to 8.5. For shallow, highly productive coastal and estuarine areas where naturally occurring pH variations approach the lethal limits of some species, changes in pH should be avoided but in any case should not exceed the limits established for fresh water, i.e., 6.5-9.0.
Phosphorus Elemental	7723140	---	---	---	---	1986	
Polychlorinated Biphenyls (PCBs) (P)	---	---	0.014	---	0.03	---	This criterion applies to total PCBs, (e.g., the sum of all congener or all isomer or homolog or Aroclor analyses.)
Selenium (P)	7782492	---	---	290	71	2016 Freshwater 1999 Saltwater	See Aquatic Life Ambient Water Quality Criterion for Selenium -Freshwater 2016 for narrative statement.
Silver (P)	7440224	3.2	---	1.9	---	1980	
Solids Suspended and Turbidity	---	---	---	---	---	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement

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Sulfide-Hydrogen Sulfide	7783064	—	2.0	—	2.0	1986	
Tainting Substances	—	—	—	—	—	1986	See Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
Temperature	—	—	—	—	—	1986	Criteria is species dependent. See Quality Criteria for Water, 1986 ("Gold Book").
Toxaphene (P)	8001352	0.73	0.0002	0.21	0.0002	1986	
Tributyltin (TBT)	—	0.46	0.072	0.42	0.0074	2004	
Zinc (P)	7440666	120	120	90	81	1995	
4,4'-DDT (P)	50293	1.1	0.001	0.13	0.001	1980	

## Appendix A

### Conversion Factors for Dissolved Metals

Metal	Freshwater CMC	Freshwater CCC	Saltwater CMC	Saltwater CCC
Arsenic	1.000	1.000	1.000	1.000
Cadmium	$1.136672 - [(\ln \text{hardness})(0.041838)]$	$1.101672 - [(\ln \text{hardness})(0.041838)]$	0.994	0.994
Chromium III	0.316	0.860	—	—
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	$1.46203 - [(\ln \text{hardness})(0.145712)]$	$1.46203 - [(\ln \text{hardness})(0.145712)]$	0.951	0.951
Mercury	0.85	0.85	0.85	0.85
Nickel	0.998	0.997	0.990	0.990
Selenium	—	—	0.998	0.998
Silver	0.85	—	0.85	—
Zinc	0.978	0.986	0.946	0.946

## Appendix B

### Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent

Chemical	mA	bA	mC	bC	Freshwater Conversion Factors (CF)	
					CMC	CCC
Cadmium	0.9789	-3.866	0.7977	-3.909	$1.136672 - [(\ln \text{hardness})(0.041838)]$	$1.101672 - [(\ln \text{hardness})(0.041838)]$
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	$1.46203 - [(\ln \text{hardness})(0.145712)]$	$1.46203 - [(\ln \text{hardness})(0.145712)]$
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.59	—	—	0.85	—
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Hardness-dependant metals' criteria may be calculated from the following:

$$\text{CMC (dissolved)} = \exp\{mA [\ln(\text{hardness})] + bA\} \text{ (CF)}$$

$$\text{CCC (dissolved)} = \exp\{mC [\ln(\text{hardness})] + bC\} \text{ (CF)}$$

1/ CMC: Criterion Maximum Concentration

2/ CCC: Criterion Continuous Concentration

Last updated on July 28, 2016





## National Recommended Water Quality Criteria - Human Health Criteria Table

Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA provides recommendations for “water + organism” and “organism only” human health criteria for states and authorized tribes to consider when adopting criteria into their water quality standards. These human health criteria are developed by EPA under Section 304(a) of the Clean Water Act.

### Human Health Water Quality Criteria

Pollutant	CAS Number	Human Health for the consumption of Water + Organism (µg/L)	Human Health for the consumption of Organism Only (µg/L)	Publication Year	Notes
Acenaphthene (P)	83329	70	90	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
Acrolein (P)	107028	3	400	2015	
Acrylonitrile (P)	107131	0.061	7.0	2015	This criterion is based on carcinogenicity of 10 <sup>-6</sup> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of 10 <sup>-5</sup> , move the decimal point in the recommended criterion one place to the right).
Aldrin (P)	309002	0.00000077	0.00000077	2015	This criterion is based on carcinogenicity of 10 <sup>-6</sup> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of 10 <sup>-5</sup> , move the decimal point in the recommended criterion one place to the right).
alpha-Hexachlorocyclohexane (HCH) (P)	319846	0.00036	0.00039	2015	
alpha-Endosulfan (P)	959988	20	30	2015	
Anthracene (P)	120127	300	400	2015	

Antimony (P)	7440360	5.6	640	2002	<p>This criterion was revised to reflect EPA's q1* or RfD as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) is from the 1980 Ambient Water Quality Criteria document.</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Arsenic (P)	7440382	0.018	0.14	1992	<p>This criterion is based on carcinogenicity of 10<sup>-6</sup> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of 10<sup>-5</sup>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p> <p>This recommended water quality criterion for arsenic refers to the inorganic form only.</p>
Asbestos (P)	1332214	7 million fibers/L	—	1991	<p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Barium	7440393	1,000	—	1986	<p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p> <p>This human health criterion is the same as originally published in the Quality Criteria for Water, 1976 ("Red Book") which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is published in the Quality Criteria for Water, 1986 ("Gold Book").</p>

Benzene (P)	71432	0.58-2.1	16-58	2015	<p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p> <p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>
Benzidine (P)	92875	0.00014	0.011	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>
Benzo(a)anthracene (P)	56553	0.0012	0.0013	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>
Benzo(a)pyrene (P)	50328	0.00012	0.00013	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Benzo(b)fluoranthene (P)	205992	0.0012	0.0013	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>
					<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the</p>

Benzo(k)fluoranthene (P)	207089	0.012	0.013	2015	decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Beryllium (P)	7440417	—	—	—	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
beta-Hexachlorocyclohexane (HCH) (P)	319857	0.0080	0.014	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
beta-Endosulfan (P)	3321365920		40	2015	
Bis(2-Chloro-1-methylethyl) Ether (P)	108601	200	4,000	2015	
Bis(2-Chloroethyl) Ether (P)	111444	0.030	2.2	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Bis(2-Ethylhexyl) Phthalate (P)	117817	0.32	0.37	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.  This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Bis(Chloromethyl) Ether	542881	0.00015	0.017	2015	
Bromoform (P)	75252	7.0	120	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.

					This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Butylbenzyl Phthalate (P)	85687	0.10	0.10	2015	
Cadmium (P)	7440439	—	—	—	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Carbon Tetrachloride (P)	56235	0.4	5	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.  This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Chlordane (P)	57749	0.00031	0.00032	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chlorobenzene (P)	108907	100	800	2015	The criterion for organoleptic (taste and odor) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.  EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chlorodibromomethane (P)	124481	0.80	21	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.

					This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Chloroform (P)	67663	60	2,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chlorophenoxy Herbicide (2,4-D)	94757	1,300	12,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	93721	100	400	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chromium (III) (P)	16065831	Total	—	—	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chromium (VI) (P)	18540299	Total	—	—	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Chrysene (P)	218019	0.12	0.13	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).  EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
					This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).

Copper (P)	7440508	1,300	—	1992	<p>This chemical has a criterion for organoleptic (taste and odor) effects. In some cases, the organoleptic criterion may be more stringent.</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Cyanide (P)	57125	4	400	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Dibenzo(a,h)anthracene (P)	53703	0.00012	0.00013	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Dichlorobromomethane (P)	75274	0.95	27	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Dieldrin (P)	60571	0.0000012	0.0000012	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Diethyl Phthalate (P)	84662	600	600	2015	
Dimethyl Phthalate (P)	131113	2,000	2,000	2015	
Di-n-Butyl Phthalate (P)	84742	20	30	2015	
Dinitrophenols	2555058710		1,000	2015	

Endosulfan Sulfate (P)	1031078	20	40	2015	
Endrin (P)	72208	0.03	0.03	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Endrin Aldehyde (P)	7421934	1	1	2015	
Ethylbenzene (P)	100414	68	130	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Fluoranthene (P)	206440	20	20	2015	
Fluorene (P)	86737	50	70	2015	
gamma-Hexachlorocyclohexane (HCH) [Lindane] (P)	58899	4.2	4.4	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Heptachlor (P)	76448	0.0000059	0.0000059	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Heptachlor Epoxide (P)	1024573	0.000032	0.000032	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
					<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the</p>



Hexachlorobenzene (P)	118741	0.000079	0.000079	2015	<p>decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Hexachlorobutadiene (P)	87683	0.01	0.01	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Hexachlorocyclohexane (HCH) - Technical	608731	0.0066	0.010	2015	
Hexachlorocyclopentadiene (P)	77474	4	4	2015	<p>The criterion for organoleptic (taste and odor) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Hexachloroethane (P)	67721	0.1	0.1	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>
Indeno(1,2,3-cd)pyrene (P)	193395	0.0012	0.0013	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>

Isophorone (P)	78591	34	1,800	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Manganese	7439965	50	100	1993	The criterion for organoleptic (taste and odor) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.  The Human Health for the consumption of Water + Organism criterion for manganese is not based on toxic effects, but rather is intended to minimize objectionable qualities such as laundry stains and objectionable tastes in beverages.
Methylmercury (P)	22967926	—	0.3 mg/kg	2001	This fish tissue residue criterion for methylmercury is based on a total fish consumption rate of 0.0175 kg/day.
Methoxychlor	72435	0.02	0.02	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Methyl Bromide (P)	74839	100	10,000	2015	
Methylene Chloride (P)	75092	20	1,000	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).  EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Nickel (P)	7440020	610	4,600	1998	This criterion was revised to reflect EPA's q1* or RfD as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) is from the 1980 Ambient Water Quality Criteria document.
Nitrates	14797558	10,000	—	1986	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's

					National Primary Drinking Water Regulations.
Nitrobenzene (P)	98953	10	600	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
Nitrosamines	—	0.0008	1.24	1980	
Nitrosodibutylamine	924163	0.0063	0.22	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Nitrosodiethylamine	55185	0.0008	1.24	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Nitrosopyrrolidine	930552	0.016	34	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
N-Nitrosodimethylamine (P)	62759	0.00069	3.0	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
N-Nitrosodi-n-Propylamine (P)	621647	0.0050	0.51	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
N-Nitrosodiphenylamine (P)	86306	3.3	6.0	2002	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
					See EPA's 2012 Recreational Water Quality Criteria

Pathogen and Pathogen Indicators	—	—	—	2012	For Shellfish see Quality Criteria for Water 1986 ("Gold Book")
Pentachlorobenzene	608935	0.1	0.1	2015	
Pentachlorophenol (P)	87865	0.03	0.04	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
pH	—	5 – 9	—	1986	
Phenol (P)	108952	4,000	300,000	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
Polychlorinated Biphenyls (PCBs) (P)		0.000064	0.000064	2002	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>This criterion applies to total PCBs (e.g., the sum of all congener or all isomer or homolog or Aroclor analyses).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Pyrene (P)	129000	20	30	2015	

Selenium (P)	7782492	170	4200	2002	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Solids Dissolved and Salinity	—	250,000	—	1986	
Tetrachloroethylene (P)	127184	10	29	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Thallium (P)	7440280	0.24	0.47	2003	
Toluene (P)	108883	57	520	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Toxaphene (P)	8001352	0.00070	0.00071	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Trichloroethylene (P)	79016	0.6	7	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p>

					EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
Vinyl Chloride (P)	75014	0.022	1.6	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
Zinc (P)	7440666	7,400	26,000	2002	The criterion for organoleptic (taste and odor) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
1,1,1-Trichloroethane (P)	71556	10,000	200,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
1,1,2,2-Tetrachloroethane (P)	79345	0.2	3	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
1,1,2-Trichloroethane (P)	79005	0.55	8.9	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
1,1-Dichloroethylene (P)	75354	300	20,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.

1,2,4,5-Tetrachlorobenzene	95943	0.03	0.03	2015	
1,2,4-Trichlorobenzene (P)	120821	0.071	0.076	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
1,2-Dichlorobenzene (P)	95501	1,000	3,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
1,2-Dichloroethane (P)	107062	9.9	650	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
1,2-Dichloropropane (P)	78875	0.90	31	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
1,2-Diphenylhydrazine (P)	122667	0.03	0.2	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
Trans-1,2-Dichloroethylene (P)	156605	100	4,000	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
1,3-Dichlorobenzene (P)	541731	7	10	2015	
					This criterion is based on carcinogenicity of $10^{-6}$ risk.

1,3-Dichloropropene (P)	542756	0.27	12	2015	Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
1,4-Dichlorobenzene (P)	106467	300	900	2015	EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.
2,3,7,8-TCDD (Dioxin) (P)	1746016	5.0E-9	5.1E-9	2002	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>EPA has issued a Maximum Contaminant Level (MCL) for this chemical which may be more stringent. See EPA's National Primary Drinking Water Regulations.</p>
2,4,5-Trichlorophenol	95954	300	600	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
2,4,6-Trichlorophenol (P)	88062	1.5	2.8	2015	<p>This criterion is based on carcinogenicity of <math>10^{-6}</math> risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of <math>10^{-5}</math>, move the decimal point in the recommended criterion one place to the right).</p> <p>The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.</p>
2,4-Dichlorophenol (P)	120832	10	60	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
2,4-Dimethylphenol (P)	105679	100	3,000	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
2,4-Dinitrophenol (P)	51285	10	300	2015	



2,4-Dinitrotoluene (P)	121142	0.049	1.7	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
2-Chloronaphthalene (P)	91587	800	1,000	2015	
2-Chlorophenol (P)	95578	30	800	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
2-Methyl-4,6-Dinitrophenol (P)	534521	2	30	2015	
3,3'-Dichlorobenzidine (P)	91941	0.049	0.15	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
3-Methyl-4-Chlorophenol (P)	59507	500	2,000	2015	The criterion for organoleptic (taste and order) effects may be more stringent. See National Recommended Water Quality Criteria - Organoleptic Effects.
p,p'-Dichlorodiphenyldichloroethane (DDD) (P)	72548	0.00012	0.00012	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
p,p'-Dichlorodiphenyldichloroethylene (DDE) (P)	72559	0.000018	0.000018	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).
p,p'-Dichlorodiphenyltrichloroethane (DDT) (P)	50293	0.000030	0.000030	2015	This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$ , move the decimal point in the recommended criterion one place to the right).

Last updated on July 29, 2016





## National Recommended Water Quality Criteria - Organoleptic Effects

Organoleptic Effects (e.g., taste and odor)

Pollutant	CAS Number	Organoleptic Effect Criteria (µg/L)
Acenaphthene	83329	20
Color	—	NP
Iron	7439896	300
Monochlorobenzene	108907	20
Tainting Substance	—	NP
3-Chlorophenol	—	0.1
4-Chlorophenol	106489	0.1
2,3-Dichlorophenol	—	0.04
2,5-Dichlorophenol	—	0.5
2,6-Dichlorophenol	—	0.2
3,4-Dichlorophenol	—	0.3
2,4,5-Trichlorophenol	95954	1
2,4,6-Trichlorophenol	88062	2
2,3,4,6-Tetrachlorophenol	—	1
2-Methyl-4-Chlorophenol	—	1800
3-Methyl-4-Chlorophenol	59507	3000
3-Methyl-6-Chlorophenol	—	20
2-Chlorophenol	95578	0.1
Copper	7440508	1000
2,4-Dichlorophenol	120832	0.3
2,4-Dimethylphenol	105679	400
Hexachlorocyclopentadiene	77474	1
Manganese	7439965	
Nitrobenzene	98953	30
Pentachlorophenol	87865	30
Phenol	108952	300
Zinc	7440666	5000

These criteria are based on organoleptic (taste and odor) effects. Because of variations in chemical nomenclature systems, this listing of pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423 (9 pp, 222 K, About PDF)

Source: Quality Criteria for Water, 1986 ("Gold Book").

**Last updated on January 15, 2016**