

40 C.F.R. § 131.36

Toxics criteria for those states not complying with Clean Water Act section 303(c)(2)(B).

(a) *Scope.* This section is not a general promulgation of the section 304(a) criteria for priority toxic pollutants but is restricted to specific pollutants in specific States.

(b)

(1) EPA's Section 304(a) criteria for Priority Toxic Pollutants.

A		B Freshwater		C Saltwater		D Human Health (10-6 risk for carcinogens) For consumption of:	
(#) Compound	CAS Number	Criterion Maximum Conc. d (µg/L) (B1)	Criterion Continuous Conc. d (µg/L) (B2)	Criterion Maximum Conc. d (µg/L) (C1)	Criterion Continuous Conc. d (µg/L) (C2)	Water & Organisms (µg/L) (D1)	Organisms Only (µg/L) (D2)
1 Antimony	7440360					14 a	4300 a
2 Arsenic	7440382	360 m	190 m	69 m	36 m	0.018 abc	0.14 abc
3 Beryllium	7440417					n	n
4 Cadmium	7440439	3.7 e	1.0 e	42 m	9.3 m	n	n
5a Chromium (III)	16065831	550 e	180 e			n	n
b Chromium (VI)	18540299	15 m	10 m	1100 m	50 m	n	n
6 Copper	7440508	17 e	11 e	2.4 m	2.4 m		
7 Lead	7439921	65 e	2.5 e	210 m	8.1 m	n	n
8 Mercury	7439976	2.1 m	0.012 ip	1.8 m	0.025 ip	0.14	0.15
9 Nickel	7440020	1400 e	160 e	74 m	8.2 m	610 a	4600 a
10 Selenium	7782492	20 p	5 p	290 m	71 m	n	n

11 Silver	7440224	3.4 e		1.9 m			
12 Thallium	7440280					1.7 a	6.3 a
13 Zinc	7440666	110 e	100 e	90 m	81 m		
14 Cyanide	57125	22	5.2	1	1	700 a	220000 aj
15 Asbestos	1332214					7,000,000 fibers/L k	
16 2,3,7,8-TCDD (Dioxin)	1746016					0.000000013 c	0.000000014 c
17 Acrolein	107028					320	780
18 Acrylonitrile	107131					0.059 ac	0.66 ac
19 Benzene	71432					1.2 ac	71 ac
20 Bromoform	75252					4.3 ac	360 ac
21 Carbon Tetrachloride	56235					0.25 ac	4.4 ac
22 Chlorobenzene	108907					680 a	21000 aj
23 Chlorodibromomethane	124481					0.41 ac	34 ac
24 Chloroethane	75003						
25 2-Chloroethylvinyl Ether	110758						
26 Chloroform	67663					5.7 ac	470 ac
27 Dichlorobromomethane	75274					0.27 ac	22 ac
28 1,1-Dichloroethane	75343						
29 1,2-Dichloroethane	107062					0.38 ac	99 ac
30 1,1-Dichloroethylene	75354					0.057 ac	3.2 ac
31 1,2-Dichloropropane	78875						
32 1,3-Dichloropropylene	542756					10 a	1700 a
33 Ethylbenzene	100414					3100 a	29000 a
34 Methyl Bromide	74839					48 a	4000 a
35 Methyl Chloride	74873					n	n
36 Methylene Chloride	75092					4.7 ac	1600 ac
37 1,1,2,2-Tetrachloroethane	79345					0.17 ac	11 ac

38 Tetrachloroethylene	127184					0.8 c	8.85 c
39 Toluene	108883					6800 a	200000 a
40 1,2-Trans-Dichloroethylene	156605						
41 1,1,1-Trichloroethane	71556					n	n
42 1,1,2-Trichloroethane	79005					0.60 ac	42 ac
43 Trichloroethylene	79016					2.7 c	81 c
44 Vinyl Chloride	75014					2 c	525 c
45 2-Chlorophenol	95578						
46 2,4-Dichlorophenol	120832					93 a	790 aj
47 2,4-Dimethylphenol	105679						
48 2-Methyl-4,6-Dinitrophenol	534521					13.4	765
49 2,4-Dinitrophenol	51285					70 a	14000 a
50 2-Nitrophenol	88755						
51 4-Nitrophenol	100027						
52 3-Methyl-4-Chlorophenol	59507						
53 Pentachlorophenol	87865	20 f	13 f	13	7.9	0.28 ac	8.2 acj
54 Phenol	108952					21000 a	4600000 aj
55 2,4,6-Trichlorophenol	88062					2.1 ac	6.5 ac
56 Acenaphthene	83329						
57 Acenaphthylene	208968						
58 Anthracene	120127					9600 a	110000 a
59 Benzidine	92875					0.00012 ac	0.00054 ac
60 Benzo(a)Anthracene	56553					0.0028 c	0.031 c
61 Benzo(a)Pyrene	50328					0.0028 c	0.031 c
62 Benzo(b)Fluoranthene	205992					0.0028 c	0.031 c
63 Benzo(ghi)Perylene	191242						
64 Benzo(k)Fluoranthene	207089					0.0028 c	0.031 c

65 Bis(2-Chloroethoxy)Methane	111911						
66 Bis(2-Chloroethyl)Ether	111444					0.031 ac	1.4 ac
67 Bis(2-Chloroisopropyl)Ether	108601					1400 a	170000 a
68 Bis(2-Ethylhexyl)Phthalate	117817					1.8 ac	5.9 ac
69 4-Bromophenyl Phenyl Ether	101553						
70 Butylbenzyl Phthalate	85687						
71 2-Chloronaphthalene	91587						
72 4-Chlorophenyl Phenyl Ether	7005723						
73 Chrysene	218019					0.0028 c	0.031 c
74 Dibenzo(ah)Anthracene	53703					0.0028 c	0.031 c
75 1,2-Dichlorobenzene	95501					2700 a	17000 a
76 1,3-Dichlorobenzene	541731					400	2600
77 1,4-Dichlorobenzene	106467					400	2600
78 3,3'-Dichlorobenzidine	91941					0.04 ac	0.077 ac
79 Diethyl Phthalate	84662					23000 a	120000 a
80 Dimethyl Phthalate	131113					313000	2900000
81 Di-n-Butyl Phthalate	84742					2700 a	12000 a
82 2,4-Dinitrotoluene	121142					0.11 c	9.1 c
83 2,6-Dinitrotoluene	606202						
84 Di-n-Octyl Phthalate	117840						
85 1,2-Diphenylhydrazine	122667					0.040 ac	0.54 ac
86 Fluoranthene	206440					300 a	370 a
87 Fluorene	86737					1300 a	14000 a
88 Hexachlorobenzene	118741					0.00075 ac	0.00077 ac
89 Hexachlorobutadiene	87683					0.44 ac	50 ac
90 Hexachlorocyclopentadiene	77474					240 a	17000 aj

91 Hexachloroethane	67721					1.9 ac	8.9 ac
92 Indeno(1,2,3-cd)Pyrene	193395					0.0028 c	0.031 c
93 Isophorone	78591					8.4 ac	600 ac
94 Naphthalene	91203						
95 Nitrobenzene	98953					17 a	1900 aj
96 N-Nitrosodimethylamine	62759					0.00069 ac	8.1 ac
97 N-Nitrosodi-n-Propylamine	621647						
98 N-Nitrosodiphenylamine	86306					5.0 ac	16 ac
99 Phenanthrene	85018						
100 Pyrene	129000					960 a	11000 a
101 1,2,4-Trichlorobenzene	120821						
102 Aldrin	309002	3 g		1.3 g		0.00013 ac	0.00014 ac
103 alpha-BHC	319846					0.0039 ac	0.013 ac
104 beta-BHC	319857					0.014 ac	0.046 ac
105 gamma-BHC	58899	2 g	0.08 g	0.16 g		0.019 c	0.063 c
106 delta-BHC	319868						
107 Chlordane	57749	2.4 g	0.0043 g	0.09 g	0.004 g	0.00057 ac	0.00059 ac
108 4,4'-DDT	50293	1.1 g	0.001 g	0.13 g	0.001 g	0.00059 ac	0.00059 ac
109 4,4'-DDE	72559					0.00059 ac	0.00059 ac
110 4,4'-DDD	72548					0.00083 ac	0.00084 ac
111 Dieldrin	60571	2.5 g	0.0019 g	0.71 g	0.0019 g	0.00014 ac	0.00014 ac
112 alpha-Endosulfan	959988	0.22 g	0.056 g	0.034 g	0.0087 g	0.93 a	2.0 a
113 beta-Endosulfan	33213659	0.22 g	0.056 g	0.034 g	0.0087 g	0.93 a	2.0 a
114 Endosulfan Sulfate	1031078					0.93 a	2.0 a
115 Endrin	72208	0.18 g	0.0023 g	0.037 g	0.0023 g	0.76 a	0.81 aj
116 Endrin Aldehyde	7421934					0.76 a	0.81 aj
117 Heptachlor	76448	0.52 g	0.0038 g	0.053 g	0.0036 g	0.00021 ac	0.00021 ac

118 Heptachlor Epoxide	1024573	0.52 g	0.0038 g	0.053 g	0.0036 g	0.00010 ac	0.00011 ac
119 PCB-1242	53469219		0.014 g		0.03 g		
120 PCB-1254	11097691		0.014 g		0.03 g		
121 PCB-1221	11104282		0.014 g		0.03 g		
122 PCB-1232	11141165		0.014 g		0.03 g		
123 PCB-1248	12672296		0.014 g		0.03 g		
124 PCB-1260	11096825		0.014 g		0.03 g		
125a PCB-1016	12674112		0.014 g		0.03 g		
125b Polychlorinated biphenyls (PCBs)						0.00017 q	0.00017 q
126 Toxaphene	8001352	0.73	0.0002	0.21	0.0002	0.00073 ac	0.00075 ac
Total Number of Criteria (h) =		24	29	23	27	85	84

Footnotes

a. Criteria revised to reflect current agency q_1^* or RfD, as contained in the Integrated Risk Information System (IRIS). The fish tissue bioconcentration factor (BCF) from the 1980 criteria documents was retained in all cases.

b. The criteria refers to the inorganic form only.

c. Criteria in the matrix based on carcinogenicity (10^{-6} risk). For a risk level of 10^{-5} , move the decimal point in the matrix value one place to the right.

d. Criteria Maximum Concentration (CMC) = the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) without deleterious effects. Criteria Continuous Concentration (CCC) = the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects. $\mu\text{g/L}$ = micrograms per liter.

e. Freshwater aquatic life criteria for these metals are expressed as a function of total hardness (mg/L as CaCO_3), the pollutant's water effect ratio (WER) as defined in § 131.36(c) and multiplied by an appropriate dissolved conversion factor as defined in § 131.36(b)(2). For comparative purposes, the values displayed in this matrix are shown as dissolved metal and correspond to a total hardness of 100 mg/L and a water effect ratio of 1.0.

f. Freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH, and are calculated as follows. Values displayed above in the matrix correspond to a pH of 7.8.

$$\text{CMC} = \exp(1.005(\text{pH}) - 4.830)$$

$$\text{CCC} = \exp(1.005(\text{pH}) - 5.290)$$

g. Aquatic life criteria for these compounds were issued in 1980 utilizing the 1980 Guidelines for criteria development. The acute values shown are final acute values (FAV) which by the 1980 Guidelines are instantaneous values as contrasted with a CMC which is a one-hour average.

h. These totals simply sum the criteria in each column. For aquatic life, there are 31 priority toxic pollutants with some type of freshwater or saltwater, acute or chronic criteria. For human health, there are 85 priority toxic pollutants with either “water + fish” or “fish only” criteria. Note that these totals count chromium as one pollutant even though EPA has developed criteria based on two valence states. In the matrix, EPA has assigned numbers 5a and 5b to the criteria for chromium to reflect the fact that the list of 126 priority toxic pollutants includes only a single listing for chromium.

i. If the CCC for total mercury exceeds 0.012 µg/l more than once in a 3-year period in the ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (1.0 mg/kg). If the FDA action level is exceeded, the State must notify the appropriate EPA Regional Administrator, initiate a revision of its mercury criterion in its water quality standards so as to protect designated uses, and take other appropriate action such as issuance of a fish consumption advisory for the affected area.

j. No criteria for protection of human health from consumption of aquatic organisms (excluding water) was presented in the 1980 criteria document or in the 1986 Quality Criteria for Water. Nevertheless, sufficient information was presented in the 1980 document to allow a calculation of a criterion, even though the results of such a calculation were not shown in the document.

k. The criterion for asbestos is the MCL (56 FR 3526, January 30, 1991).

l. [Reserved: This letter not used as a footnote.]

m. Criteria for these metals are expressed as a function of the water effect ratio, WER, as defined in 40 CFR 131.36(c).

CMC = column B1 or C1 value × WER
CCC = column B2 or C2 value × WER

n. EPA is not promulgating human health criteria for this contaminant. However, permit authorities should address this contaminant in NPDES permit actions using the State's existing narrative criteria for toxics.

o. [Reserved: This letter not used as a footnote.]

p. Criterion expressed as total recoverable.

q. This criterion applies to total PCBs (e.g., the sum of all congener or isomer or homolog or Aroclor analyses).

General Notes

1. This chart lists all of EPA's priority toxic pollutants whether or not criteria recommendations are available. Blank spaces indicate the absence of criteria recommendations. Because of variations in chemical nomenclature systems, this listing of toxic pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423. EPA has added the Chemical Abstracts Service (CAS) registry numbers, which provide a unique identification for each chemical.

2. The following chemicals have organoleptic based criteria recommendations that are not included on this chart (for reasons which are discussed in the preamble): copper, zinc, chlorobenzene, 2-chlorophenol, 2,4-dichlorophenol, acenaphthene, 2,4-dimethylphenol, 3-methyl-4-chlorophenol, hexachlorocyclopentadiene, pentachlorophenol, phenol.

3. For purposes of this rulemaking, freshwater criteria and saltwater criteria apply as specified in 40 CFR 131.36(c).

Note to paragraph (b)(1):

On April 14, 1995, the Environmental Protection Agency issued a stay of certain criteria in paragraph (b)(1) of this section as follows: the criteria in columns B and C for arsenic, cadmium, chromium (VI), copper, lead, nickel, silver, and zinc; the criteria in B1 and C1 for mercury; the criteria in column B for chromium (III); and the criteria in column C for selenium. The stay remains in effect until further notice.

(2) Factors for Calculating Hardness-Dependent, Freshwater Metals Criteria

CMC = WER exp { $m_A[\ln(\text{hardness})] + b_A$ } × Acute Conversion Factor CCC = WER exp { $m_C[\ln(\text{hardness})] + b_C$ } × Chronic Conversion Factor Final CMC and CCC values should be rounded to two significant figures.

Metal	m_A	b_A	m_C	b_C	Freshwater conversion factors	
					Acute	Chronic
Cadmium	1.128	-3.828	0.7852	-3.490	^a 0.944	^a 0.909
Chromium (III)	0.8190	3.688	0.8190	1.561	0.316	0.860
Copper	0.9422	-1.464	0.8545	-1.465	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	^a 0.791	^a 0.791
Nickel	0.8460	3.3612	0.8460	1.1645	0.998	0.997
Silver	1.72	-6.52	^b N/A	^b N/A	0.85	^b N/A
Zinc	0.8473	0.8604	0.8473	0.7614	0.978	0.986

Note to table: The term “exp” represents the base e exponential function.

Footnotes to table:

^a The freshwater conversion factors (CF) for cadmium and lead are hardness-dependent and can be calculated for any hardness [see limitations in § 131.36(c)(4)] using the following equations:

Cadmium

Acute: $CF = 1.136672 - [(\ln \text{ hardness})(0.041838)]$

Chronic: $CF = 1.101672 - [(\ln \text{ hardness})(0.041838)]$

Lead (Acute and Chronic): $CF = 1.46203 - [(\ln \text{ hardness})(0.145712)]$

^b No chronic criteria are available for silver.

(c) *Applicability.* (1) The criteria in paragraph (b) of this section apply to the States' designated uses cited in paragraph (d) of this section and supersede any criteria adopted by the State, except when State regulations contain criteria which are more stringent for a particular use in which case the State's criteria will continue to apply.

(2) The criteria established in this section are subject to the State's general rules of applicability in the same way

and to the same extent as are the other numeric toxics criteria when applied to the same use classifications including mixing zones, and low flow values below which numeric standards can be exceeded in flowing fresh waters.

(i) For all waters with mixing zone regulations or implementation procedures, the criteria apply at the appropriate locations within or at the boundary of the mixing zones; otherwise the criteria apply throughout the waterbody including at the end of any discharge pipe, canal or other discharge point.

(ii) A State shall not use a low flow value below which numeric standards can be exceeded that is less stringent than the following for waters suitable for the establishment of low flow return frequencies (*i.e.*, streams and rivers):

Aquatic Life	
Acute criteria (CMC)	1 Q ₁₀ or 1 B ₃
Chronic criteria (CCC)	7 Q ₁₀ or 4 B ₃
Human Health	
Non-carcinogens	30 Q ₅
Carcinogens	Harmonic mean flow

Where:

CMC—criteria maximum concentration—the water quality criteria to protect against acute effects in aquatic life and is the highest instream concentration of a priority toxic pollutant consisting of a one-hour average not to be exceeded more than once every three years on the average; CCC—criteria continuous concentration—the water quality criteria to protect against chronic effects in aquatic life is the highest instream concentration of a priority toxic pollutant consisting of a 4-day average not to be exceeded more than once every three years on the average; 1 Q₁₀ is the lowest one day flow with an average recurrence frequency of once in 10 years determined hydrologically; 1 B₃ is biologically based and indicates an allowable exceedence of once every 3 years. It is determined by EPA's computerized method (DFLOW model); 7 Q₁₀ is the lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years determined hydrologically; 4 B₃ is biologically based and indicates an allowable exceedence for 4 consecutive days once every 3 years. It is determined by EPA's computerized method (DFLOW model); 30 Q₅ is the lowest average 30 consecutive day low flow with an average recurrence frequency of once in 5 years determined hydrologically; and the harmonic mean flow is a long term mean flow value calculated by dividing the number of daily flows analyzed by the sum of the reciprocals of those daily flows.

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