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ARARs Q's & A's: Compliance With Federal Water Quality Criteria

Office of Emergency and Remedial Response
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Quick Reference Fact Sheet

Section 121(d) of CERCLA, as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA), requires that on-site remedial actions must at least attain Federal and more stringent State applicable or relevant and appropriate requirements (ARARs) upon completion of the remedial action. The 1990 National Contingency Plan (NCP) requires compliance with ARARs during remedial actions as well as at completion, and compels attainment of ARARs during removal actions whenever practicable. See NCP, 55 FR 8666, 8843 (March 8, 1990) (to be codified at 40 CFR section 300.414(i)), and 55 FR 8666, 8852 (March 8, 1990) (to be codified at 40 CFR 300.435(b)(2)).

To implement the ARARs provision, EPA has developed guidance, CERCLA Compliance With Other Laws Manual: Parts I and II (Publications 9234.1-01 and 9234.1-02), and has provided training to Regions and States on the identification of and compliance with ARARs. These "ARARs Q's and A's" are part of a series of Fact Sheets that provide answers to a number of questions that arose in developing ARAR policies, in ARAR training sessions, and in identifying and complying with ARARs at specific sites. This particular Q's and A's Fact Sheet addresses compliance with Federal Water Quality Criteria (FWQC) as ARARs.

Q1. What are the Federal Water Quality Criteria?

A. Federal Water Quality Criteria (FWQC) are nonenforceable guidance established by EPA for evaluating toxic effects on human health and aquatic organisms. FWQC are used or considered by the States in setting their water quality standards (WQSs) for surface water. State WQSs consist of designated uses (i.e., fishing, swimming, drinking water) and criteria for pollutants set at levels that are protective of those uses. State WQSs are regulatory requirements, and permit limits are established to ensure that the State use designations and criteria are met.

There are two categories of FWQC that relate to human exposure:

- Ingestion of contaminated drinking water and contaminated fish; and,
- Ingestion of contaminated fish alone.

FWQC have been published for many different contaminants (both noncarcinogens and carcinogens). FWQC for noncarcinogens are generally set above zero, and address chronic and toxic effects. FWQC for carcinogens are recommended at zero, although a range of concentrations corresponding to incremental cancer risks of 10^{-5}, 10^{-6}, and 10^{-7} are provided for informational purposes and do not represent an Agency judgement on an "acceptable" risk level.

In addition to the FWQC published for two human exposure scenarios, FWQC are published for four other categories. They consist of acute and chronic toxicity for fresh and saltwater aquatic life.

Q2. Do FWQC constitute potential ARARs for Superfund sites?

A. Yes. Although compliance with FWQC is not legally required at non-Superfund sites, and they are not "legally applicable" requirements under CERCLA, FWQC may be ARARs when found by the Agency to be relevant and appropriate (see final NCP preamble, 55 FR at 8742 (March 8, 1990). Specifically, CERCLA section 121(d)(2)(A) states that every remedial action "shall require a level or standard of control which at least attains ... water quality criteria established under section 304 or 303 of the Clean Water Act, where such ... criteria are relevant and appropriate under the circumstances of the release or threatened release."

Q3. When are FWQC best suited to serve as cleanup standards?

A. FWQC for specific pollutants should generally be identified as ARARs for surface-water cleanup if

particular circumstances exist at the site that FWQC were specifically designed to protect, unless the State has promulgated WQSs for the specific pollutants and water body at the site. Standards that are specifically suited to site circumstances should generally be used to establish cleanup levels at sites where those circumstances are present.[1] A State WQS may be a site-specific adaptation of a FWQC. In such cases, they are generally the appropriate standards for the specific pollutant and water body, rather than the FWQC. In the absence of any State WQSs specific to the pollutant and water body of concern, FWQC may be ARARs for surface-water bodies when:

- Protection of aquatic life is a concern. Examples include sites where:
  - adverse impacts to aquatic life are foreseen at the site; or
  - the surface-water bodies are designated for the protection of aquatic life.
- Human exposure from consumption of contaminated fish is a concern.

For sites where protection of aquatic life is a concern, the FWQC for fresh or saltwater aquatic life (whichever is pertinent) may be ARARs. When human exposure from consumption of contaminated fish is a concern (e.g., sites that require remediation of recreational water bodies, saltwater bodies, or estuaries used for fishing), the FWQC published for human exposure from consumption of fish may be ARARs for the sites. Examples include sites where the surface-water bodies are used for fishing and an exposure route consists of consumption of contaminated fish from the site.

Note, however, that if any of the above-mentioned water bodies are also used for drinking, standards for acceptable levels of contaminants in drinking water may also be potential ARARs for the site (e.g., non-zero maximum contaminant level goals (MCLGs), maximum contaminant levels (MCLs), State WQSs designated for drinking-water use, and FWQC adjusted to reflect cleanup standards for drinking water). (Question #5 of this fact sheet addresses how to determine the ARAR in these situations, when there are both drinking-water and environmental concerns at the site.)

Q4. Should FWQC be used to set drinking-water cleanup levels for surface water at sites that do not present environmental concerns?

A. Rarely. FWQC should be used to set drinking-water cleanup levels only when surface water serves as an actual or potential drinking-water source and other cleanup standards for drinking water (e.g., non-zero MCLGs, MCLs, or State WQSs designated for drinking-water use) are not available. (see Question 5 if impacts to aquatic organisms have also been identified at the site). Where surface water serves as an actual or potential drinking-water source and there are no impacts to aquatic organisms, the following requirements, where relevant and appropriate, should be attained in the following order:

- State WQSs that are designated for drinking-water use, and are more stringent than MCLs or non-zero MCLGs, or specific to the uses of that water body; or, if none,
- Non-zero MCLGs; or, if none,
- MCLs; or, if none,
- FWQC adjusted for drinking-water use.

Q5. Should FWQC be used to set drinking water cleanup levels for surface water at sites that do present environmental concerns?

A. It depends. Generally, non-zero MCLGs or MCLs should be identified as the ARARs for cleanup of water that is or may be a potential source of drinking water. However, at sites that also present environmental concerns, RPMs should compare the stringency of the non-zero MCLGs or MCLs to the pertinent FWQC for aquatic life at the site. If the FWQC for the aquatic life are more stringent, they may be the relevant and appropriate requirements to meet at the site. For example, the levels needed to protect aquatic organisms from volatile organics are generally much less stringent than the levels needed to protect human exposure from drinking water. Therefore, non-zero MCLGs or MCLs would adequately protect both humans and most aquatic life from volatile organics. However, the levels needed to protect aquatic life from metals are more stringent than those levels required to protect human exposure from drinking water. As a result, the FWQC for aquatic organisms would protect both humans and aquatic life from metals, whereas non-zero MCLGs or MCLs may not.

[1] See proposed NCP preamble, 53 FR at 51442 (Dec. 21, 1988), and the final NCP preamble, 55 FR at 8755 (March 8, 1990). NOTE: the guidance set out in the proposed NCP is still effective where not superseded by guidance or regulations in the final NCP. See 55 FR at 8666, col. 3.

Q6. Should FWQC be used to set cleanup standards for ground water?

A. Rarely. FWQC should be used to set cleanup standards for ground water only if the ground water is a current or potential source of drinking water, and other cleanup standards for drinking water (such as MCLs and non-zero MCLGs) are not available. If FWQC are used to set cleanup standards for ground water, the FWQC should first be adjusted for drinking-water use (as discussed in Question 7). Note: the issue becomes more complicated at sites where the ground water flows into the surface water. Where the ground water flows naturally into the surface water, the ground-water remediation should be designed so that the receiving surface-water body will be able to meet any ambient water-quality standards (such as State WQSs or FWQC) that may be ARARs for the surface water. This means that the FWQC should be considered when establishing cleanup levels for the ground water at those sites, but they are not necessarily ARARs for the cleanup of ground water. At sites where the discharge from a ground-water treatment facility will be deposited into the surface water, the discharged water will have to meet all effluent limitations found in the applicable State National Pollutant Discharge Elimination System (NPDES) permits, rather than the FWQC. (The NPDES effluent limitations will assure compliance with State WQSs.)

Q7. What is required to develop cleanup levels based on FWQC for human exposure from drinking water alone?

A. In those rare circumstances where the FWQC will be used to establish cleanup levels for drinking water, RPMs must adjust the original equation used to develop FWQC for human exposure from both ingestion of contaminated drinking water and contaminated fish. When adjusting the FWQC to develop cleanup standards for human exposure from drinking water alone, RPMs should use the standard exposure assumptions (i.e., 2 liters of water, 6.5 grams of edible aquatic products, and an average body weight of 70 kg), unless data are available indicating that the standard exposure assumptions are not pertinent to the area in which the site is located (see **Highlight 1**). Note, however, that adjustment of the FWQC for drinking is not simply a matter of sub-tracting one FWQC from another.

While it is possible to derive cleanup levels for drinking water from FWQC, FWQC were not intended to be used as drinking-water cleanup standards, since no criteria are provided for human exposure from ingestion of water alone. Moreover, the values derived from the FWQC (in contrast with those derived from MCLs and MCLGs) do not reflect the contribution of other sources through an apportionment factor. Therefore, FWQC may be less useful as cleanup standards for potential drinking water than the MCL/MCLG drinking-water standards (see proposed NCP preamble, 53 FR at 51442, and final NCP preamble, 55 FR at 8755).

Highlight 1: NONCARCINOGENIC EQUATION

For noncarcinogens, acceptable daily intakes (ADIs) and criteria derived therefrom are calculated from total exposure data that include contributions from the diet and air. The equation used to derive the criterion (C) is:

$$C = ADI - (DT+IN)/[2 \text{ liters} + (0.0065 \text{ kg} \times R)]$$

where:

2 liters is assumed daily water consumption;
0.0065 kg is assumed daily fish consumption;
R is bioconcentration factor in units of 1/kg;
DT is estimated non-fish dietary intake; and
IN is estimated daily intake by inhalation.

The equation for carcinogens is not provided in this fact sheet because FWQC for carcinogens are recommended at zero, and therefore are not ARARs for the Superfund program (see Question #8 of this fact sheet).

Q8. How should EPA comply when FWQC for carcinogens are determined to be potential ARARs?

A. As previously mentioned, the recommended FWQC for carcinogens are set at zero. Consistent with Superfund policy on MCLGs, the zero-value FWQC, since they cannot be measured, would not be considered appropriate cleanup standards and, thus, are not "relevant and appropriate requirements" within the meaning of CERCLA section 121(d)(2)(A) (see final NCP preamble, 55 FR at 8755). Accordingly, they are not ARARs and, therefore, they do not need to be attained or waived.

For the carcinogens, the Office of Water Regulations and Standards (OWRS) has also published for informational purposes three concentration levels corresponding to incremental cancer risks of 10^{-5}, 10^{-6}, and 10^{-7}, respectively. OWRS has expressly stated in the preamble to their FWQC publications that it makes no judgment or recommendation as to which of the three concentrations provides an "acceptable" risk level for carcinogens. Instead, these concentration levels have been provided for informational purposes only and, therefore, simply constitute guidance to-be-considered (TBCs) for the Superfund program. As a result, an ARAR waiver is unnecessary for FWQC published for carcinogens;

because FWQC recommended at zero are not ARARs, the three alternative values are TBCs.

Q9. What other factors should be considered in determining whether FWQC are relevant and appropriate requirements?

A. CERCLA requires that in determining whether a FWQC constitutes a relevant and appropriate requirement, EPA must consider the designated or potential use of the surface or ground water, the environmental media affected, the purposes for which such criteria were developed, and the latest available scientific information available (see CERCLA section 121(d)(2)(B)(i)). With regard to this last factor, OWRS periodically publishes FWQC for additional constituents and occasionally updates existing ones. Prior to using an FWQC for a particular constituent, RPMs should consult the IRIS data base maintained by the EPA Office of Research and Development and contact their Regional Water Office for the most recent listing, to ensure consideration of the latest available scientific information. See Attachment 1 for a list of the FWQC, current as of June 15, 1990. [Note: the FWQC chart issued by the EPA Office of Water Regulations and Standards, dated January 2, 1987, is no longer current and should not be used as a reference.]

NOTICE: The policies set out in this ARARs Q's and A's are intended solely for guidance. They are not intended, nor can they be relied upon, to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided in this Q's and A's, or to act at variance with the guidance, based on an analysis of specific site circumstances. The Agency also reserves the right to change this guidance at any time without public notice.

ATTACHMENT 1
FEDERAL WATER QUALITY CRITERIA

(#)	A COMPOUND	CAS Number	B FRESHWATER Criterion Maximum Conc. (ug/L) B1	B FRESHWATER Criterion Continuous Conc. (ug/L) B2	C SALTWATER Criterion Maximum Conc. (ug/L) C1	C SALTWATER Criterion Continuous Conc. (ug/L) C2	D HUMAN HEALTH (10^{-6} risk for carcinogens) For Consumption of: Water & Organisms (ug/L) D1	D HUMAN HEALTH (10^{-6} risk for carcinogens) For Consumption of: Organisms Only (ug/L) D2
1	Antimony	7440360					14 *	4300 *
2	Arsenic	7440382	360	190	69	36	0.018 *†	0.14 *†
3	Beryllium	7440417					0.0076 †	0.131 †
4	Cadmium	7440439	3.9 **	1.1 **	43	9.3	10 *	170 *
5a	Chromium (III)	7440473	1700 **	210 **			33000 *	670000 *
b	Chromium (VI)	7440473	16	11	1100	50	170 *	3400 *
6	Copper	7440508	18 **	12 **	2.9	2.9	1300 *	
7	Lead	7439921	82 **	3.2 **	220	8.5	50	
8	Mercury	7439976	2.4	0.012	2.1	0.025	0.14	0.15
9	Nickel	7440020	1400 **	160 **	75	8.3	510 *	3800 *
10	Selenium	7782492	20	5	300	71	104 *	6800 *
11	Silver	7440224	4.1 **		2.3		91 *	
12	Thallium	7440280					2.0 *	7.2 *
13	Zinc	7440666	120 **	110 **	95	86		
14	Cyanide	57125	22	5.2	1	1	700 *	215000 *
15	Asbestos	1332214					30000 fibers/L	
16	2,3,7,8-TCDD (Dioxin)	1746016					0.00000013 †	0.00000014 †
17	Acrolein	107028					320	780
18	Acrylonitrile	107131					0.059 *†	0.67 *†
19	Benzene	71432					1.2 *†	71 *†
20	Bromoform	75252					5.7 *†	470 *†
21	Carbon Tetrachloride	56235					0.25 *†	4.5 *†
22	Chlorobenzene	108907					488	
23	Chlorodibromomethane	124481					5.7 *†	470 *†
24	Chloroethane	75003						
25	2-Chloroethylvinyl Ether	110758					0.032 *†	18 *†
26	Chloroform	67663					5.70 *†	470 *†
27	Dichlorobromomethane	75274					5.70 *†	470 *†
28	1,1-Dichloroethane	75343						
29	1,2-Dichloroethane	107062					0.38 *†	99 *†
30	1,1-Dichloroethylene	75354					0.057 *†	3.2 *†
31	1,2-Dichloropropane	78875						
32	1,3-Dichloropropylene	542756					10 *	1700 *
33	Ethylbenzene	100414					3100 *	29000 *
34	Methyl Bromide	74839					48 *	4000 *
35	Methyl Chloride	74873					5.7 *†	470 *†
36	Methylene Chloride	75092					4.7 *†	1600 *†
37	1,1,2,2-Tetrachloroethane	79345					0.17 *†	11 *†
38	Tetrachloroethylene	127184					0.8	8.85
39	Toluene	108883					10000 *	300000 *
40	1,2-Trans-Dichloroethylene	156605					700 *	140000 *
41	1,1,1-Trichloroethane	71556					3100 *	170000 *
42	1,1,2-Trichloroethane	79005					0.60 *†	42 *†
43	Trichloroethylene	79016					2.7 †	81 †
44	Vinyl Chloride	75014					2 †	525 †

	A		B		C		D	
			FRESHWATER		SALTWATER		HUMAN HEALTH (10^{-6} risk for carcinogens)	
(#)	COMPOUND	CAS Number	Criterion Maximum Conc. (ug/L) B1	Criterion Continuous Conc. (ug/L) B2	Criterion Maximum Conc. (ug/L) C1	Criterion Continuous Conc. (ug/L) C2	For Consumption of: Water & Organisms (ug/L) D1	Organisms Only (ug/L) D2
45	2-Chlorophenol	95578					120 *	
46	2,4-Dichlorophenol	120832					93 *	790 *
47	2,4-Dimethylphenol	105679						
48	2-Methyl-4,6-Dinitrophenol	534521					13.4	765
49	2,4-Dinitrophenol	51285					70 *	14000 *
50	2-Nitrophenol	88755						
51	4-Nitrophenol	100027						
52	3-Methyl-4-Chlorophenol	59507						
53	Pentachlorophenol	87865	20 ***	13 ***	13	7.9	1000 *	29000 *
54	Phenol	108952					21 *	4600 *
55	2,4,6-Trichlorophenol	88062					1.2 †	3.6 †
56	Acenaphthene	83329					1200 *	2700 *
57	Acenaphthylene	208968					0.0028 †	0.0311 †
58	Anthracene	120127					0.0028 †	0.0311 †
59	Benzidine	92875					0.00012 *†	0.00054 *†
60	Benzo(a)Anthracene	56553					0.0028 †	0.0311 †
61	Benzo(a)Pyrene	50328					0.0028 †	0.0311 †
62	3,4-Benzofluoranthene	205992					0.0028 †	0.0311 †
63	Benzo(ghi)Perylene	191242					0.0028 †	0.0311 †
64	Benzo(k)Fluoranthene	207089					0.0028 †	0.0311 †
65	Bis(2-Chloroethoxy)Methane	111911						
66	Bis(2-Chloroethyl)Ether	111444					0.031 *†	1.4 *†
67	Bis(2-Chloroisopropyl)Ether	108601					1400 *	170000 *
68	Bis(2-Ethylhexyl)Phthalate	117817					1.8 *†	5.9 *†
69	4-Bromophenyl Phenyl Ether	101553						
70	Butylbenzyl Phthalate	85687					3000 *	5200 *
71	2-Chloronaphthalene	91587						
72	4-Chlorophenyl Phenyl Ether	7005723						
73	Chrysene	218019					0.0028 †	0.0311 †
74	Dibenz(a,h)Anthracene	53703					0.0028 †	0.0311 †
75	1,2-Dichlorobenzene	95501					2700 *	17000 *
76	1,3-Dichlorobenzene	541731					400	2600
77	1,4-Dichlorobenzene	106467					400	2600
78	3,3'-Dichlorobenzidine	91941					0.04 *†	0.077 *†
79	Diethyl Phthalate	84662					23000 *	120000 *
80	Dimethyl Phthalate	131113					313000	2900000
81	Di-n-Butyl Phthalate	84742					2700 *	12000 *
82	2,4-Dinitrotoluene	121142					0.11 †	9.1 †
83	2,6-Dinitrotoluene	606202						
84	Di-n-Octyl Phthalate	117840						
85	1,2-Diphenylhydrazine	122667					0.041 *†	0.54 *†
86	Fluoranthene	206440					42	54
87	Fluorene	86737					0.0028 †	0.031 †
88	Hexachlorobenzene	118741					0.00072 †	0.00074 †
89	Hexachlorobutadiene	87683					0.44 *†	50 *†

	A		B		C		D	
			FRESHWATER		SALTWATER		HUMAN HEALTH (10^{-6} risk for carcinogens)	
(#)	COMPOUND	CAS Number	Criterion Maximum Conc. (ug/L) B1	Criterion Continuous Conc. (ug/L) B2	Criterion Maximum Conc. (ug/L) C1	Criterion Continuous Conc. (ug/L) C2	For Consumption of: Water & Organisms (ug/L) D1	Organisms Only (ug/L) D2
90	Hexachlorocyclopentadiene	77474					242 *	17400 *
91	Hexachloroethane	67721					2.0 *†	8.9 *†
92	Indeno(1,2,3-cd)Pyrene	193395					0.0028 †	0.0311 †
93	Isophorone	78591					6900 *	490000 *
94	Naphthalene	91203						
95	Nitrobenzene	98953					17 *	1900 *
96	N-Nitrosodimethylamine	62759					0.00069 *†	8.1 *†
97	N-Nitrosodi-n-Propylamine	621647					0.005 *†	8.5 *†
98	N-Nitrosodiphenylamine	86306					5.0 *†	16 *†
99	Phenanthrene	85018					0.0028 †	0.0311 †
100	Pyrene	129000					0.0028 †	0.0311 †
101	1,2,4-Trichlorobenzene	120821						
102	Aldrin	309002	3 ‡		1.3 ‡		0.00013 *†	0.00014 *†
103	alpha-BHC	319846					0.0039 *†	0.013 *†
104	beta-BHC	319857					0.014 *†	0.046 *†
105	gamma-BHC	58899	2 ‡	0.08 ‡	0.16 ‡		0.019 †	0.063 †
106	delta-BHC	319868						
107	Chlordane	57749	2.4 ‡	0.0043 ‡	0.09 ‡	0.004 ‡	0.00058 *†	0.00059 *†
108	4-4'-DDT	50293	1.1 ‡	0.001 ‡	0.13 ‡	0.001 ‡	0.00059 *†	0.00059 *†
109	4,4'-DDE	72559					0.00059 *†	0.00059 *†
110	4,4'-DDD	72548					0.00083 *†	0.00083 *†
111	Dieldrin	60571	2.5 ‡	0.0019 ‡	0.71 ‡	0.0019 ‡	0.00014 *†	0.00014 *†
112	alpha-Endosulfan	959988	0.22 ‡	0.056 ‡	0.034 ‡	0.0087 ‡	0.93 *	2.0 *
113	beta-Endosulfan	33213659	0.22 ‡	0.056 ‡	0.034 ‡	0.0087 ‡	0.93 *	2.0 *
114	Endosulfan Sulfate	1031078					0.93 *	2.0 *
115	Endrin	72208	0.18 ‡	0.0023 ‡	0.037 ‡	0.0023 ‡	0.76 *	0.81 *
116	Endrin Aldehyde	7421934					0.76 *	0.81 *
117	Heptachlor	76448	0.52 ‡	0.0038 ‡	0.053 ‡	0.0036 ‡	0.00021 *†	0.00021 *†
118	Heptachlor Epoxide	1024573	0.52 ‡	0.0038 ‡	0.053 ‡	0.0036 ‡	0.00010 *†	0.00011 *†
119	PCB-1242	1336363		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
120	PCB-1254	11097691		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
121	PCB-1221	11104282		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
122	PCB-1232	11141165		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
123	PCB-1248	12672296		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
124	PCB-1260	11096825		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
125	PCB-1016	12674112		0.014 ‡		0.03 ‡	0.000044 *†	0.000045 *†
126	Toxaphene	8001352	0.73	0.0002	0.21	0.0002	0.00073 *†	0.00075 *†

* Criteria revised to reflect current agency q_1^* or RfD, as contained in the Integrated Risk Information System (IRIS).

** Freshwater aquatic life criteria for these metals are expressed as a function of total hardness (mg/L), as follows (where exp represents the base e exponential function). (Values displayed above correspond to a total hardness of 100 mg/L.)

$$CMC = \exp(m_A[\ln(\text{hardness})] + b_A) \qquad CCC = \exp(m_C[\ln(\text{hardness})] + b_C)$$

	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	0.7852	-3.490
Copper	0.9422	-1.464	0.8545	-1.465
Chromium (III)	0.8190	3.688	0.8190	1.561
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	3.3612	0.8460	1.1645
Silver	1.72	-6.52		
Zinc	0.8473	0.8604	0.8473	0.7614

*** Freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH, and are calculated as follows. (Values displayed above correspond to a pH of 7.8.)

$$CMC = \exp(1.005(pH) - 4.830) \qquad CCC = \exp(1.005(pH) - 5.290)$$

† Criteria based on carcinogenicity (10^{-6} risk).

‡ 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) and according to the 1980 Guidelines the Acute values were intended to be interpreted as instantaneous maximum values, and the chronic values shown were interpreted as 24 - hour average values. EPA has not updated these criteria pursuant to the 1985 Guidelines. However, as an approximation, dividing the final acute values in columns B1 and C1 by 2 yields a Criterion Maximum Concentration. No numeric changes are required for columns B2 and C2, and EPA suggests using these values directly as Criterion Continuous Concentration.

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.

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	2,4-Dimethylphenol
Zinc	3-Methyl-4-Chlorophenol

3) For purposes of this rulemaking, freshwater criteria apply at salinity levels equal to or less than 5 parts per thousand (ppt); saltwater criteria apply at salinity levels greater than 5 ppt (0/00).

6/15/90