



Canadian Water Quality Guidelines for the Protection of Aquatic Life

SUMMARY TABLE

Summary of Canadian water quality guidelines for the protection of aquatic life.

| Parameter ^a | Freshwater | | Marine | |
|--|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Acenaphthene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Acridine [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Aldicarb | 1 ^c | 1993 | 0.15 ^c | 1993 |
| Aldrin + Dieldrin ^d | 0.004 ^{e, f} | 1987 | | |
| Aluminum ^d | 5–100 ^g | 1987 | | |
| Ammonia (total) ^d | 1370–2200 ^h | 1987 | | |
| Aniline | 2.2 ⁱ | 1993 | Insufficient data | 1993 |
| Anthracene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Arsenic ^j | 5.0 ^k | 1997 | 12.5 ^c | 1997 |
| Atrazine | 1.8 ⁱ | 1989 | | |
| Benz(<i>a</i>)anthracene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Benzene ^j | 370 ^{c, k} | 1999 | 110 ^c | 1999 |
| Benzo(<i>a</i>)pyrene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| 2,2-Bis(<i>p</i> -chlorophenyl)-1,1,1-trichloroethane [See DDT (total)] | | | | |
| Bromacil | 5.0 ^{c, i} | 1997 | Insufficient data | 1997 |
| Bromoform [See Halogenated methanes, Tribromomethane] | | | | |
| Bromoxynil | 5.0 ⁱ | 1993 | Insufficient data | 1993 |
| Cadmium | 0.017 ^{c, l} | 1996 | 0.12 ⁱ | 1996 |
| Captan | 1.3 ^c | 1991 | | |
| Carbaryl | 0.20 ⁱ | 1997 | 0.32 ^{c, i} | 1997 |
| Carbofuran | 1.8 ⁱ | 1989 | | |
| Carbon tetrachloride [See Halogenated methanes, Tetrachloromethane] | | | | |
| Chlordane ^d | 0.006 ^{e, f} | 1987 | | |
| Chlorinated benzenes | | | | |
| Monochlorobenzene | 1.3 ^{c, k} | 1997 | 25 ^{c, k} | 1997 |
| 1,2-Dichlorobenzene | 0.70 ^{c, k} | 1997 | 42 ^{c, k} | 1997 |
| 1,3-Dichlorobenzene | 150 ^{c, k} | 1997 | Insufficient data ^k | 1997 |
| 1,4-Dichlorobenzene | 26 ^{c, k} | 1997 | Insufficient data ^k | 1997 |
| 1,2,3-Trichlorobenzene | 8.0 ^{c, k} | 1997 | Insufficient data ^k | 1997 |

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| Parameter ^a | Freshwater | | Marine | |
|---|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Chlorinated benzenes—Continued | | | | |
| 1,2,4-Trichlorobenzene | 24 ^{c, k} | 1997 | 5.4 ^{c, k} | 1997 |
| 1,3,5-Trichlorobenzene ^d | Insufficient data ^k | 1997 | Insufficient data ^k | 1997 |
| 1,2,3,4-Tetrachlorobenzene | 1.8 ^{c, k} | 1997 | Insufficient data ^k | 1997 |
| 1,2,3,5-Tetrachlorobenzene ^d | Insufficient data ^k | 1997 | Insufficient data ^k | 1997 |
| 1,2,4,5-Tetrachlorobenzene ^d | Insufficient data ^k | 1997 | Insufficient data | 1997 |
| Pentachlorobenzene | 6.0 ^{c, k} | 1997 | Insufficient data | 1997 |
| Hexachlorobenzene ^d | Insufficient data ^{e, f, k} | 1997 | Insufficient data | 1997 |
| Chlorinated ethanes | | | | |
| 1,2-Dichloroethane | 100 ^{c, i} | 1991 | Insufficient data | 1991 |
| 1,1,1-Trichloroethane | Insufficient data | 1991 | Insufficient data | 1991 |
| 1,1,2,2-Tetrachloroethane | Insufficient data | 1991 | Insufficient data | 1991 |
| Chlorinated ethenes | | | | |
| 1,1,2-Trichloroethene (Tichloroethylene; TCE) | 21 ^{c, i} | 1991 | Insufficient data | 1991 |
| 1,1,2,2-Tetrachloroethene (Tetrachloroethylene; PCE) | 111 ^{c, i} | 1993 | Insufficient data | 1993 |
| Chlorinated methanes [See Halogenated methanes] | | | | |
| Chlorinated phenols ^d | | | | |
| Monochlorophenols | 7 | 1987 | | |
| Dichlorophenols | 0.2 | 1987 | | |
| Trichlorophenols | 18 | 1987 | | |
| Tetrachlorophenols | 1 | 1987 | | |
| Pentachlorophenol (PCP) | 0.5 | 1987 | | |
| Chlorine, reactive [See Reactive chlorine species] | | | | |
| Chloroform [See Halogenated methanes, Trichloromethane] | | | | |
| 4-Chloro-2-methyl phenoxy acetic acid [See MCPA] | | | | |
| Chlorothalonil | 0.18 ^c | 1994 | 0.36 ^c | 1994 |
| Chlorpyrifos | 0.0035 | 1997 | 0.002 ^c | 1997 |
| Chromium | | | | |
| Trivalent chromium (Cr(III)) | 8.9 ^{c, k} | 1997 | 56 ^{c, k} | 1997 |
| Hexavalent chromium (Cr(VI)) | 1.0 ^k | 1997 | 1.5 ^k | 1997 |
| Chrysene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Colour | Narrative | 1999 | Narrative | 1999 |
| Copper ^d | 2–4 ^m | 1987 | | |
| Cyanazine | 2.0 ^{c, i} | 1990 | | |
| Cyanide ^d | 5 (as free CN) | 1987 | | |

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| Parameter ^a | Freshwater | | Marine | |
|--|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| DDAC (Didecyl dimethyl ammonium chloride) | 1.5 | 1999 | | |
| DDT (total) ^d (2,2-Bis(<i>p</i> -chlorophenyl)-1,1,1-trichloroethane; dichloro diphenyl trichloroethane) | 0.001 ^{e, f} | 1987 | | |
| Debris (litter/settleable matter) | | | Narrative ^e | 1996 |
| Deltamethrin | 0.0004 | 1997 | Insufficient data | 1997 |
| Deposited bedload sediment [See Total particulate matter] | | | | |
| Dibromochloromethane [See Halogenated methanes] | | | | |
| Dicamba | 10 ^{c, i} | 1993 | | |
| Dichlorobenzene [See Chlorinated benzenes] | | | | |
| Dichlorobromomethane [See Halogenated methanes] | | | | |
| Dichloro diphenyl trichloroethane [See DDT (total)] | | | | |
| Dichloroethane [See Chlorinated ethanes] | | | | |
| Dichloroethylene [See Chlorinated ethanes, 1,2-Dichloroethane] | | | | |
| Dichloromethane [See Halogenated methanes] | | | | |
| Dichlorophenols [See Chlorinated phenols] | | | | |
| 1,3-Dichlorophenoxyacetic acid [see Phenoxy herbicides] | | | | |
| Diclofop-methyl | 6.1 | 1993 | | |
| Didecyl dimethyl ammonium chloride [See DDAC] | | | | |
| Diethylene glycol [See Glycols] | | | | |
| Di(2-ethylhexyl) phthalate [See Phthalate esters] | | | | |
| Dimethoate | 6.2 ^c | 1993 | Insufficient data | 1993 |
| Di- <i>n</i> -butyl phthalate [See Phthalate esters] | | | | |
| Di- <i>n</i> -octyl phthalate [See Phthalate esters] | | | | |
| Dinoseb | 0.05 | 1992 | | |
| Dissolved gas supersaturation | Narrative | 1999 | Narrative | 1999 |
| Dissolved oxygen | 5500–9500 ^{k, n} | 1999 | >8000 & narrative ^{c, k} | 1996 |
| Endosulfan ^d | 0.02 | 1987 | | |
| Endrin ^d | 0.0023 ^{f, i} | 1987 | | |
| Ethylbenzene ^j | 90 ^{c, k} | 1996 | 25 ^{c, k} | 1996 |
| Ethylene glycol [See Glycols] | | | | |
| Fluoranthene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Fluorene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |

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Continued.

| Parameter ^a | Freshwater | | Marine | |
|---|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Glycols | | | | |
| Ethylene glycol | 192 000 ^k | 1997 | Insufficient data | 1997 |
| Diethylene glycol | Insufficient data ^k | 1997 | Insufficient data | 1997 |
| Propylene glycol | 500 000 ^k | 1997 | Insufficient data | 1997 |
| Glyphosate | 65 ^c | 1989 | | |
| Halogenated methanes | | | | |
| Monochloromethane (Methyl chloride) ^d | Insufficient data | 1992 | Insufficient data | 1992 |
| Dichloromethane (Methylene chloride) | 98.1 ^{c, i} | 1992 | Insufficient data | 1992 |
| Trichloromethane (Chloroform) | 1.8 ^{c, i} | 1992 | Insufficient data | 1992 |
| Tetrachloromethane (Carbon tetrachloride) | 13.3 ^{c, i} | 1992 | Insufficient data | 1992 |
| Monobromomethane (Methyl bromide) ^d | Insufficient data | 1992 | Insufficient data | 1992 |
| Tribromomethane (Bromoform) ^d | Insufficient data | 1992 | Insufficient data | 1992 |
| Dibromochloromethane ^d | Insufficient data | 1992 | Insufficient data | 1992 |
| Dichlorobromomethane ^d | Insufficient data | 1992 | Insufficient data | 1992 |
| HCB [See Hexachlorobutadiene (HCB)] | | | | |
| Heptachlor (Heptachlor epoxide) ^d | 0.01 ^{e, f} | 1987 | | |
| Hexachlorobenzene [See Chlorinated benzenes] | | | | |
| Hexachlorobutadiene (HCB) | 1.3 ^{c, k} | 1999 | | |
| Hexachlorocyclohexane (Lindane) ^d | 0.01 | 1987 | | |
| Hypochlorous acid [See Reactive chlorine species] | | | | |
| 3-Iodo-2-propynyl butyl carbamate [See IPBC] | | | | |
| IPBC (3-Iodo-2-propynyl butyl carbamate) | 1.9 | 1999 | | |
| Iron ^d | 300 | 1987 | | |
| Lead ^d | 1–7 ^o | 1987 | | |
| Lindane [See Hexachlorocyclohexane] | | | | |
| Linuron | 7.0 ^c | 1995 | Insufficient data | 1995 |
| MCPA (4-Chloro-2-methyl phenoxy acetic acid; 2-methyl-4-chloro phenoxy acetic acid) | 2.6 ^c | 1995 | 4.2 ^c | 1995 |
| Mercury ^d | 0.1 | 1987 | | |
| Methyl bromide [See Halogenated methanes, Monobromomethane] | | | | |
| Methyl chloride [See Halogenated methanes, Monochloromethane] | | | | |
| 2-Methyl-4-chloro phenoxy acetic acid [See MCPA] | | | | |
| Methylene chloride [See Halogenated methanes, Dichloromethane] | | | | |
| Metolachlor | 7.8 ^c | 1991 | | |
| Metribuzin | 1.0 ^c | 1990 | | |
| Molybdenum ^j | 73 ^c | 1999 | | |
| Monobromomethane [See Halogenated methanes] | | | | |

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| Parameter ^a | Freshwater | | Marine | |
|--|--|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Monochloramine [See Reactive chlorine species] | | | | |
| Monochlorobenzene [See Chlorinated benzenes] | | | | |
| Monochloromethane [See Halogenated methanes] | | | | |
| Monochlorophenols [See Chlorinated phenols] | | | | |
| Naphthalene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Nickel ^d | 25–150 ^P | 1987 | | |
| Nitrate ^d | Concentrations that stimulate weed growth should be avoided. | 1987 | | |
| Nitrite ^d | 60 | 1987 | | |
| Organotins | | | | |
| Tributyltin | 0.008 ^c | 1992 | 0.001 | 1992 |
| Tricyclohexyltin | Insufficient data | 1992 | Insufficient data | 1992 |
| Triphenyltin | 0.022 ^{c, i} | 1992 | Insufficient data | 1992 |
| Oxygen, dissolved [See Dissolved oxygen] | | | | |
| PAHs [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| PCBs [See Polychlorinated biphenyls (PCBs)(total)] | | | | |
| PCE [See Chlorinated ethenes, 1,1,2,2-Tetrachloroethene] | | | | |
| PCP [See Chlorinated phenols, Pentachlorophenol] | | | | |
| Pentachlorobenzene [See Chlorinated benzenes] | | | | |
| Pentachlorophenol [See Chlorinated phenols] | | | | |
| pH | 6.5–9 ^d | 1987 | 7.0–8.7 & narrative | 1996 |
| Phenanthrene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Phenols (mono- & dihydric) | 4.0 ^k | 1999 | | |
| Phenoxy herbicides ^{d, q} | 4.0 | 1987 | | |
| Phthalate esters | | | | |
| Di- <i>n</i> -butyl phthalate | 19 ^c | 1993 | Insufficient data | 1993 |
| Di(2-ethylhexyl) phthalate | 16 ^c | 1993 | Insufficient data | 1993 |
| Di- <i>n</i> -octyl phthalate | Insufficient data | 1993 | Insufficient data | 1993 |
| Picloram | 29 ^c | 1990 | | |
| Polychlorinated biphenyls (PCBs) (total) ^d | 0.001 ^{e, f} | 1987 | 0.01 ^{e, f} | 1991 |

Continued.

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|--|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Polycyclic aromatic hydrocarbons (PAHs) | | | | |
| Acenaphthene | 5.8 ^c | 1999 | Insufficient data | 1999 |
| Acridine | 4.4 ^c | 1999 | Insufficient data | 1999 |
| Anthracene | 0.012 ^c | 1999 | Insufficient data | 1999 |
| Benz(<i>a</i>)anthracene | 0.018 ^c | 1999 | Insufficient data | 1999 |
| Benzo(<i>a</i>)pyrene | 0.015 ^c | 1999 | Insufficient data | 1999 |
| Chrysene | Insufficient data | 1999 | Insufficient data | 1999 |
| Fluoranthene | 0.04 ^c | 1999 | Insufficient data | 1999 |
| Fluorene | 3.0 ^c | 1999 | Insufficient data | 1999 |
| Naphthalene | 1.1 ^c | 1999 | 1.4 ^c | 1999 |
| Phenanthrene | 0.4 ^c | 1999 | Insufficient data | 1999 |
| Pyrene | 0.025 ^c | 1999 | Insufficient data | 1999 |
| Quinoline | 3.4 ^c | 1999 | Insufficient data | 1999 |
| Propylene glycol [See Glycols] | | | | |
| Pyrene [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Quinoline [See Polycyclic aromatic hydrocarbons (PAHs)] | | | | |
| Reactive chlorine species (hypochlorous acid and monochloramine) | 0.5 | 1999 | 0.5 | 1999 |
| Salinity | | | <10% fluctuation ^c | 1996 |
| Selenium ^d | 1.0 | 1987 | | |
| Silver ^d | 0.1 | 1987 | | |
| Simazine | 10 | 1991 | | |
| Streambed substrate [See Total particulate matter] | | | | |
| Styrene | 72 ^c | 1999 | | |
| Suspended sediments [See Total particulate matter] | | | | |
| TCE [See Chlorinated ethenes, 1,1,2-Trichloroethene] | | | | |
| Tebuthiuron | 1.6 ^c | 1995 | Insufficient data | 1995 |
| Temperature | Narrative ^d | 1987 | Not to exceed $\pm 1^\circ\text{C}^c$ | 1996 |
| Tetrachlorobenzene [See Chlorinated benzenes] | | | | |
| Tetrachloroethane [See Chlorinated ethanes] | | | | |
| Tetrachloroethene [See Chlorinated ethenes] | | | | |
| Tetrachloroethylene [See Chlorinated ethenes, 1,1,2,2-Tetrachloroethene] | | | | |
| Tetrachloromethane [See Halogenated methanes] | | | | |
| Tetrachlorophenols [See Chlorinated phenols] | | | | |
| Thallium ^j | 0.8 | 1999 | | |
| Toluene | 2.0 ^{c, j, k} | 1996 | 215 ^{c, k} | 1996 |

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Continued.

| Parameter ^a | Freshwater | | Marine | |
|--|---|-------------------|---|-------------------|
| | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b | Concentration ($\mu\text{g}\cdot\text{L}^{-1}$) | Date ^b |
| Total particulate matter ^f | | | | |
| Deposited bedload sediment | Insufficient data | 1999 | Insufficient data | 1999 |
| Streambed substrate | Narrative | 1999 | Narrative | 1999 |
| Suspended sediments | Narrative | 1999 | Narrative | 1999 |
| Turbidity | Narrative | 1999 | Narrative | 1999 |
| Toxaphene ^d | 0.008 ^{e, f} | 1987 | | |
| Triallate | 0.24 ^c | 1992 | | |
| Tribromomethane [See Halogenated methanes] | | | | |
| Tributyltin [See Organotins] | | | | |
| Trichlorobenzene [See Chlorinated benzenes] | | | | |
| Trichloroethane [See Chlorinated ethanes] | | | | |
| Trichloroethene [See Chlorinated ethenes] | | | | |
| Trichloroethylene [See Chlorinated ethenes, 1,1,2-Trichloroethene] | | | | |
| Trichloromethane [See Halogenated methanes] | | | | |
| Trichlorophenols [See Chlorinated phenols] | | | | |
| Tricyclohexyltin [See Organotins] | | | | |
| Trifluralin | 0.20 ⁱ | 1993 | | |
| Triphenyltin [See Organotins] | | | | |
| Turbidity [See Total particulate matter] | | | | |
| Zinc ^d | 30 | 1987 | | |

^aUnless otherwise indicated, supporting documents are available from the Guidelines and Standards Division, Environment Canada.

^bThe guidelines dated 1987 have been carried over from *Canadian Water Quality Guidelines* (CCREM 1987) and no fact sheet was prepared. The guidelines dated 1989 to 1997 were developed and initially published in CCREM 1987 as appendixes on the date indicated. They are published as fact sheets in this document. Other guidelines dated 1997 and those dated 1999 are published for the first time in this document.

^cInterim guideline.

^dNo fact sheet created.

^eThis guideline (originally published in *Canadian Water Quality Guidelines* [CCREM 1987 + Appendixes] in 1987 or 1991 [PCBs in marine waters]) is no longer recommended and the value is withdrawn. A water quality guideline is not recommended. Environmental exposure is predominantly via sediment, soil, and/or tissue, therefore, the reader is referred to the respective guidelines for these media.

^fThis substance meets the criteria for Track 1 substances under the national CCME Policy for the Management of Toxic Substances (PMTS) (i.e., persistent, bioaccumulative, primarily the result of human activity, and CEPA-toxic or equivalent), and should be subject to virtual elimination strategies. Guidelines can serve as action levels or interim management objectives towards virtual elimination.

^gAluminum guideline = $5 \mu\text{g}\cdot\text{L}^{-1}$ at pH <6.5; $[\text{Ca}^{2+}] < 4 \text{ mg}\cdot\text{L}^{-1}$; $\text{DOC} < 2 \text{ mg}\cdot\text{L}^{-1}$
= $100 \mu\text{g}\cdot\text{L}^{-1}$ at pH ≥ 6.5 ; $[\text{Ca}^{2+}] \geq 4 \text{ mg}\cdot\text{L}^{-1}$; $\text{DOC} \geq 2 \text{ mg}\cdot\text{L}^{-1}$

^hAmmonia guideline = $1370 \mu\text{g}\cdot\text{L}^{-1}$ at pH 8.0; 10°C
= $2200 \mu\text{g}\cdot\text{L}^{-1}$ at pH 6.5; 10°C

ⁱGuideline value slightly modified from CCREM 1987 + Appendixes due to re-evaluation of the significant figures.

^jThe technical document for the guideline is available from the Ontario Ministry of the Environment.

^kSubstance has been re-evaluated since CCREM 1987 + Appendixes. Either a new guideline has been derived or insufficient data existed to derive a new guideline.

^lCadmium guideline = $10^{\{0.86[\log(\text{hardness})] - 3.2\}}$

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^mCopper guideline = 2 µg·L⁻¹ at [CaCO₃] = 0–120 mg·L⁻¹
= 3 µg·L⁻¹ at [CaCO₃] = 120–180 mg·L⁻¹
= 4 µg·L⁻¹ at [CaCO₃] >180 mg·L⁻¹

ⁿDissolved oxygen for warm-water biota: early life stages = 6000 µg·L⁻¹
other life stages = 5500 µg·L⁻¹
for cold-water biota: early life stages = 9500 µg·L⁻¹
other life stages = 6500 µg·L⁻¹

^oLead guideline = 1 µg·L⁻¹ at [CaCO₃] = 0–60 mg·L⁻¹
= 2 µg·L⁻¹ at [CaCO₃] = 60–120 mg·L⁻¹
= 4 µg·L⁻¹ at [CaCO₃] = 120–180 mg·L⁻¹
= 7 µg·L⁻¹ at [CaCO₃] >180 mg·L⁻¹

^pNickel guideline = 25 µg·L⁻¹ at [CaCO₃] = 0–60 mg·L⁻¹
= 65 µg·L⁻¹ at [CaCO₃] = 60–120 mg·L⁻¹
= 110 µg·L⁻¹ at [CaCO₃] = 120–180 mg·L⁻¹
= 150 µg·L⁻¹ at [CaCO₃] >180 mg·L⁻¹

^qThe guideline of 4.0 µg·L⁻¹ for phenoxy herbicides is based on data for ester formulations of 2,4-dichlorophenoxyacetic acid.

^rThe technical document for the guideline is available from British Columbia Ministry of Environment, Lands and Parks.

Reference

CCREM (Canadian Council of Resource and Environment Ministers). 1987. Canadian water quality guidelines. Prepared by the Task Force on Water Quality Guidelines.

Reference listing:

Canadian Council of Ministers of the Environment. 1999. Canadian water quality guidelines for the protection of aquatic life: Summary table. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

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