# Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses

## SUMMARY TABLE

## Update October 2005

**Summary of Canadian water quality guidelines for the protection of agricultural water uses.**

| | Irrigation water | | Livestock water | |
|---|---|---|---|---|
| **Parameter[a]** | **Concentration ($\mu g \cdot L^{-1}$)** | **Date[b]** | **Concentration ($\mu g \cdot L^{-1}$)** | **Date[b]** |
| Aldicarb | 54.9[c] | 1993 | 11[c] | 1993 |
| Algae, blue-green [See Blue-green algae] | | | | |
| Aluminum[d] | 5000 | 1987 | 5000 | 1987 |
| Aniline[d] | Insufficient data | 1993 | Insufficient data | 1993 |
| Arsenic[e] | 100[f] | 1997 | 25[f] | 1997 |
| Atrazine | 10[f] | 1989 | 5[f, g] | 1989 |
| Beryllium[d] | 100 | 1987 | 100[f] | 1987 |
| 2,2-Bis(*p*-chlorophenyl)-1,1,1-trichloroethane [See DDT (total)] | | | | |
| Blue-green algae (Cyanobacteria)[d] | | | Avoid heavy growths | 1987 |
| Boron[d] | 500–6000[h] | 1987 | 5000 | 1987 |
| Bromacil | 0.2[f] | 1997 | 1100[f] | 1997 |
| Bromoform [See Halogenated methanes, Tribromomethane] | | | | |
| Bromoxynil | 0.33[i] | 1993 | 11[f] | 1993 |
| Cadmium | 5.1[i, j] | 1996 | 80 | 1996 |
| Calcium[d] | | | 1 000 000 | 1987 |
| Captan | Insufficient data | 1991 | 13[f, i] | 1991 |
| Carbaryl | Insufficient data | 1997 | 1100 | 1997 |
| Carbofuran | Insufficient data | 1989 | 45 | 1989 |
| Carbon tetrachloride [See Halogenated methanes, Tetrachloromethane] | | | | |
| Chlordane[d] | | | ~~7~~ [l, m] | 1987 |
| Chloride[d] | 100 000–700 000[k] | 1987 | | |
| Chlorinated benzenes | | | | |
| Monochlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2-Dichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,3-Dichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,4-Dichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2,3-Trichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2,4-Trichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,3,5-Trichlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2,3,4-Tetrachlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2,3,5-Tetrachlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| 1,2,4,5-Tetrachlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |

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| | Irrigation water | | Livestock water | |
|---|---|---|---|---|
| **Parameter**[a] | **Concentration ($\mu g \cdot L^{-1}$)** | **Date**[b] | **Concentration ($\mu g \cdot L^{-1}$)** | **Date**[b] |
| Pentachlorobenzene[d] | Insufficient data[n] | 1997 | Insufficient data[n] | 1997 |
| Hexachlorobenzene | Insufficient data[n] | 1997 | 0.52[f, n] | 1997 |
| Chlorinated ethanes[d] | | | | |
| 1,2-Dichloroethane | Insufficient data | 1991 | 5[f] | 1991 |
| 1,1,1-Trichloroethane | Insufficient data | 1991 | Insufficient data | 1991 |
| 1,1,2,2-Tetrachloroethane | Insufficient data | 1991 | Insufficient data | 1991 |
| Chlorinated ethenes[d] | | | | |
| 1,1,2-Trichloroethene (Trichloroethylene; TCE) | Insufficient data | 1991 | 50[f] | 1991 |
| 1,1,2,2-Tetrachloroethene (Tetrachloroethylene; PCE) | Insufficient data | 1993 | Insufficient data | 1993 |
| Chlorinated methanes [See Halogenated methanes] | | | | |
| Chloroform [See Halogenated methanes, Trichloromethane] | | | | |
| 4-Chloro-2-methyl phenoxy acetic acid [See MCPA] | | | | 1995 |
| Chlorothalonil | 5.8[f] (other crops) | 1994 | 170[f] | 1994 |
| Chlorpyrifos | Insufficient data | 1997 | 24[f] | 1997 |
| Chromium | | | | |
| Trivalent chromium (Cr(III)) | 4.9[f, n] | 1997 | 50[f, n] | 1997 |
| Hexavalent chromium (Cr(VI)) | 8.0[n] | 1997 | 50[f, n] | 1997 |
| Cobalt[d] | 50 | 1987 | 1000 | 1987 |
| Coliforms, fecal[d] | 100/100 mL | 1987 | | |
| Coliforms, total[d] | 1000/100 mL | 1987 | | |
| Colour | | | Narrative | 1999 |
| Copper[d] | 200–1000[o] | 1987 | 500–5000[p] | 1987 |
| Cyanazine | 0.5[f] | 1990 | 10[f] | 1990 |
| Cyanobacteria [See Blue-green algae] | | | | |
| DDT (total) (2,2-Bis(*p*-chlorophenyl)-1,1,1-trichloroethane; Dichloro diphenyl trichloroethane)[d] | | | ~~30~~ [l, m] | 1987 |
| Deltamethrin | Insufficient data | 1997 | 2.5 | 1997 |
| Dibromochloromethane [See Halogenated methanes] | | | | |
| Dicamba | 0.006 | 1993 | 122 | 1993 |
| Dichlorobenzene [See Chlorinated benzenes] | | | | |
| Dichlorobromomethane [See Halogenated methanes] | | | | |
| Dichloro diphenyl trichloroethane [See DDT (total)] | | | | |
| Dichloroethane [See Chlorinated ethanes] | | | | |

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| Parameter[a] | Irrigation water | | Livestock water | |
|---|---|---|---|---|
| | Concentration (µg·L$^{-1}$) | Date[b] | Concentration (µg·L$^{-1}$) | Date[b] |
| Dichloromethane [See Halogenated methanes] | | | | |
| Diclofop-methyl | 0.18 | 1993 | 9[f] | 1993 |
| Diethylene glycol [See Glycols] | | | | |
| Dimethoate | Insufficient data | 1993 | 3[f] | 1993 |
| Diisopropanolamine | 2 000[f] | 2005 | Insufficient data | 2005 |
| Dinoseb | 16[j] | 1992 | 150 | 1992 |
| Dissolved solids, total [See Total dissolved solids (salinity)] | | | | |
| Endrin[d] | | | ~~0.2~~[l, m] | 1987 |
| Ethylbenzene[d, e] | Insufficient data | 1996 | 2.4 | 1996 |
| Ethylene glycol [See Glycols] | | | | |
| Fecal coliforms [See Coliforms, fecal] | | | | |
| Fluoride[d] | 1000 | 1987 | 1000–2000[q] | 1987 |
| Glycols[d] | | | | |
| Ethylene glycol | Insufficient data | 1997 | Insufficient data | 1997 |
| Diethylene glycol | Insufficient data | 1997 | Insufficient data | 1997 |
| Propylene glycol | Insufficient data | 1997 | Insufficient data | 1997 |
| Glyphosate[d] | | | 280 | 1989 |
| Halogenated methanes[d] | | | | |
| Monochloromethane (Methyl chloride) | Insufficient data | 1992 | Insufficient data | 1992 |
| Dichloromethane[d] (Methylene chloride) | Insufficient data | 1992 | 50[f] | 1992 |
| Trichloromethane[d] (Chloroform) | Insufficient data | 1992 | 100[g] | 1992 |
| Tetrachloromethane[d] (Carbon tetrachloride) | Insufficient data | 1992 | 5[f] | 1992 |
| Monobromomethane (Methyl bromide) | Insufficient data | 1992 | Insufficient data | 1992 |
| Tribromomethane[d] (Bromoform) | Insufficient data | 1992 | 100[g] | 1992 |
| Dichlorobromomethane[d] | Insufficient data | 1992 | 100[g] | 1992 |
| Dibromochloromethane[d] | Insufficient data | 1992 | 100[g] | 1992 |
| Heptachlor (Heptachlor epoxide)[d] | | | ~~3~~[l, m] | 1987 |
| Hexachlorobenzene [See Chlorinated benzenes] | | | | |
| Hexachlorocyclohexane (Lindane)[d] | | | 4 | 1987 |
| Iron[d] | 5000 | 1987 | | |
| Lead[d] | 200 | 1987 | 100 | 1987 |
| Lindane [See Hexachlorocyclohexane] | | | | |
| Linuron | 0.071[f] | 1995 | Insufficient data | 1995 |
| Lithium[d] | 2500 | 1987 | | |

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| | Irrigation water | | Livestock water | |
|---|---|---|---|---|
| **Parameter**[a] | **Concentration (µg·L$^{-1}$)** | **Date**[b] | **Concentration (µg·L$^{-1}$)** | **Date**[b] |
| Manganese[d] | 200 | 1987 | | |
| MCPA (4-Chloro-2-methyl phenoxy acetic acid; 2-Methyl-4-chloro phenoxy acetic acid) | 0.025[i] | 1995 | 25[f] | 1995 |
| Mercury[d] | | | 3 | 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 | 28[f] | 1991 | 50[f] | 1991 |
| Metribuzin | 0.5[f] | 1990 | 80 | 1990 |
| Molybdenum[d] | 10–50[r] | 1987 | 500 | 1987 |
| Monobromomethane [See Halogenated methanes] | | | | |
| Monochlorobenzene [See Chlorinated benzenes] | | | | |
| Monochloromethane [See Halogenated methanes] | | | | |
| Nickel[d] | 200 | 1987 | 1000 | 1987 |
| Nitrate + nitrite[d] | | | 100 000 | 1987 |
| Nitrite[d] | | | 10 000 | 1987 |
| Organotins[d] | | | | |
| Tributyltin | Insufficient data | 1992 | 250 | 1992 |
| Tricyclohexyltin | Insufficient data | 1992 | 250[f] | 1992 |
| Triphenyltin | Insufficient data | 1992 | 820[f, i] | 1992 |
| PCE [See Chlorinated ethenes, 1,1,2,2-Tetrachloroethene] | | | | |
| Pentachlorobenzene [See Chlorinated benzenes] | | | | |
| Phenol[d] | | | 2 | 1987 |
| Phenoxy herbicides[d] | | | 100 | 1987 |
| Picloram[d] | Insufficient data | 1990 | 190 | 1990 |
| Propylene glycol [See Glycols] | | | | |
| Selenium[d] | 20–50[s] | 1987 | 50 | 1987 |
| Simazine | 0.5[f] | 1991 | 10[f] | 1991 |
| Sulfolane | 500[f] | 2005 | Insufficient data | 2005 |
| Sulphate[d] | | | 1 000 000 | 1987 |
| TCE [See Chlorinated ethenes, 1,1,2-Trichloroethene] | | | | |
| Tebuthiuron | 0.27[f] (cereals) | 1995 | 130[f] | 1995 |

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| Parameter[a] | Irrigation water | | Livestock water | |
|---|---|---|---|---|
| | Concentration (µg·L$^{-1}$) | Date[b] | Concentration (µg·L$^{-1}$) | Date[b] |
| 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] | | | | |
| Toluene[d, e] | Insufficient data | 1996 | 24 | 1996 |
| Total coliforms [See Coliforms, total] | | | | |
| Total dissolved solids (salinity)[d] | 500 000–3 500 000[t] | 1987 | 3 000 000 | 1987 |
| Toxaphene[d] | | | ~~5~~[l, m] | 1987 |
| Triallate[d] | Insufficient data | 1992 | 230[f] | 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] | | | | |
| Tricyclohexyltin [See Organotins] | | | | |
| Trifluralin | Insufficient data | 1992 | 45[f] | 1992 |
| Triphenyltin [See Organotins] | | | | |
| Uranium[d] | 10[f] | 1987 | 200 | 1987 |
| Vanadium[d] | 100 | 1987 | 100 | 1987 |
| Zinc[d] | 1000–5000[u] | 1987 | 50 000 | 1987 |

[a]Unless otherwise indicated, supporting documents are available from the Guidelines and Standards Division, Environment Canada.

[b]The 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.

[c]Concentration of total aldicarb residues.

[d]No fact sheet created.

[e]The technical document for the guideline is available from the Ontario Ministry of the Environment.

[f]Interim guideline.

[g]During the initial development of this guideline, insufficient data were available to derive a livestock watering guideline value. Therefore, the Canadian drinking water quality guideline (Health and Welfare Canada 1987) was adopted. Since then, this value has been revised by Health Canada (1996). This revised drinking water quality guideline in now adopted as the guideline for livestock water.

[h]Boron guideline
=500 µg·L$^{-1}$ for blackberries
=500–1000 µg·L$^{-1}$ for peaches, cherries, plums, grapes, cowpeas, onions, garlic, sweet potatoes, wheat, barley, sunflowers, mung beans, sesame, lupins, strawberries, Jerusalem artichokes, kidney beans, and lima beans
= 1000–2000 µg·L$^{-1}$ for red peppers, peas, carrots, radishes, potatoes, and cucumbers
= 2000–4000 µg·L$^{-1}$ for lettuce, cabbage, celery, turnips, Kentucky bluegrass, oats, corn, artichokes, tobacco, mustard, clover, squash, and muskmelons
= 4000–6000 µg·L$^{-1}$ for sorghum, tomatoes, alfalfa, purple vetch, parsley, red beets, and sugar beets
= 6000 µg·L$^{-1}$ for asparagus

[i]Guideline value slightly modified from CCREM 1987 + Appendixes due to re-evaluation of the significant figures.

[j]Guideline is crop-specific (see fact sheet).

[k]Chloride guideline
Foliar damage
= 100–178 mg·L$^{-1}$ for almond apricots and plums
= 178–355 mg·L$^{-}$1 for grapes, peppers, potatoes, and tomatoes
= 355–710 mg·L$^{-1}$ for alfalfa, barley, corn, and cucumbers
>710 mg·L$^{-1}$ for cauliflower, cotton, safflower, sesame, sorghum, sugar beets, and sunflowers

Rootstocks
=180–600 mg·L$^{-1}$ for stone fruit (peaches, plums, etc.)
=710–900 mg·L$^{-1}$ for grapes

Cultivars
= 110–180 mg·L$^{-1}$ for strawberries
= 230–460 mg·L$^{-1}$ for grapes
= 250 mg·L$^{-1}$ for boysenberries, blackberries, and raspberries

[l]This guideline (originally published in *Canadian Water Quality Guidelines* [CCREM 1987]) 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.

[m]This 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 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.

[n]Substance has been re-evaluated since CCREM 1987 + Appendixes. Either a new guideline has been derived or insufficient data existed to derive a new guideline.

[o]Copper guideline
= 200 µg·L$^{-1}$ for cereals
= 1000 µg·L$^{-1}$ for tolerant crops

[p]Copper guideline
= 500 µg·L$^{-1}$ for sheep, 1000 µg·L$^{-1}$ for cattle, 5000 µg·L$^{-1}$ for swine and poultry.

[q]Fluoride guideline
= 1000 µg·L$^{-1}$ if feed contains fluoride

[r]Molybdenum guideline
= 50 µg·L$^{-1}$ for short-term use on acidic soils

[s]Selenium guideline
= 20 µg·L$^{-1}$ for continuous use
= 50 µg·L$^{-1}$ for intermittent use

[t]Total dissolved solids guideline
= 500 mg·L$^{-1}$ for strawberries, raspberries, beans, and carrots
= 500–800 mg·L$^{-1}$ for boysenberries, currants, blackberries, gooseberries, plums, grapes, apricots, peaches, pears, cherries, apples, onions, parsnips, radishes, peas, pumpkins, lettuce, peppers, muskmelons, sweet potatoes, sweet corn, potatoes, celery, cabbage, kohlrabi, cauliflower, cowpeas, broadbeans, flax, sunflowers, and corn
= 800–1500 mg·L$^{-1}$ for spinach, cantaloupe, cucumbers, tomatoes, squash, brussels sprouts, broccoli, turnips, smooth brome, alfalfa, big trefoil, beardless wildrye, vetch, timothy, and crested wheat grass
= 1500–2500 mg·L$^{-1}$ for beets, zucchini, rape, sorghum, oat hay, wheat hay, mountain brome, tall fescue, sweet clover, reed canary grass, birdsfoot trefoil, perennial ryegrass
= 3500 mg·L$^{-1}$ for asparagus, soybeans, safflower, oats, rye, wheat, sugar beets, barley, barley hay, and tall wheat grass

[u]Zinc guideline
= 1000 µg·L$^{-1}$ when soil pH < 6.5
= 5000 µg·L$^{-1}$ when soil pH > 6.5

### References:

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

Health and Welfare Canada. 1987. Guidelines for Canadian drinking water quality. 3d ed. Prepared by the Federal–Provincial Subcommittee on Drinking Water of the Federal–Provincial Advisory Committee on Environmental and Occupational Health.

Health Canada, 1996. Guidelines for Canadian drinking water quality. 6th ed. Prepared by the Federal–Provincial Subcommittee on Drinking Water of the Federal–Provincial Committee on Environmental and Occupational Health.

**Reference listing:**

Canadian Council of Ministers of the Environment. 2005. Canadian water quality guidelines for the protection of agricultural water uses: Summary table. Updated October 2005. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

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