Withdrawal of Select Guidelines for Canadian Drinking Water Quality

Document for Public Consultation

Consultation period ends
April 24, 2020

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Table of Contents

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Purpose of consultation

Health Canada, in collaboration with the Federal-Provincial-Territorial Committee on Drinking Water (CDW), previously established Guidelines for Canadian Drinking Water Quality for 1,2-dichlorobenzene, 2,4-dichlorophenol, 2,3,4,6-tetrachlorophenol, azinphos-methyl, carbaryl, carbofuran, chlorpyrifos, diazinon, diclofop-methyl, diuron, metolachlor, monochlorobenzene, paraquat, phorate, picloram, simazine, terbufos, and trifluralin. Health Canada, in collaboration with the CDW, has recently assessed current available information for these chemical contaminants and is proposing to withdraw their guidelines as it was determined that Guidelines for Canadian Drinking Water Quality are no longer required since these contaminants are unlikely to be found in Canadian drinking water at levels that may pose a risk to human health.

The purpose of this consultation is to solicit comments on the proposed withdrawal of these guidelines and on the rationale supporting their proposed withdrawal. This document is available for a 60-day public consultation period. Please send comments (with rationale, where required) to Health Canada:

HC.water-eau.SC@canada.ca
or
Water and Air Quality Bureau, Health Canada
269 Laurier Avenue West, A.L. 4903D
Ottawa, Ontario, K1A 0K9

All comments must be received before April 24, 2020. Comments received as part of this consultation will be shared with the appropriate CDW member, along with the name and affiliation of their author. Authors who do not want their name and affiliation shared with their CDW member should provide a statement to this effect along with their comments.

It should be noted that this proposed document may be revised following the evaluation of comments received. This document should be considered as a draft for comment only.

Withdrawal of Select Guidelines for Canadian Drinking Water Quality

Executive summary

Health Canada, in collaboration with the Federal-Provincial-Territorial Committee on Drinking Water, is proposing to withdraw the existing Guidelines for Canadian Drinking Water Quality (GCDWQ) for 18 chemical substances, including 14 pesticides, as it was determined that GCDWQ are no longer required since these contaminants are unlikely to be found in Canadian drinking water at levels that may pose a risk to human health.

Pesticides proposed for withdrawal are azinphos-methyl, carbaryl, carbofuran, chlorpyrifos, diazinon, diclofop-methyl, diuron, metolachlor, paraquat, phorate, picloram, simazine, terbufos, and trifluralin. Other chemical substances proposed for withdrawal are 1,2-dichlorobenzene, 2,4-dichlorophenol, 2,3,4,6-tetrachlorophenol and monochlorobenzene.

This document summarizes the current available information supporting the proposed withdrawal of the 18 GCDWQ, based on a thorough review of the current science, registration status (for pesticides) and Canadian exposures.

International considerations

The proposed withdrawal of the GCDWQ for 1,2-dichlorobenzene, 2,4-dichlorophenol, 2,3,4,6-tetrachlorophenol, azinphos-methyl, carbaryl, carbofuran, chlorpyrifos, diazinon, diclofop-methyl, diuron, metolachlor, monochlorobenzene, paraquat, phorate, picloram, simazine, terbufos, and trifluralin is specific to the Canadian exposure context.

Internationally, drinking water standards or guidelines for these chemical contaminants would exist in order to address specific needs and/or exposure scenarios that differ from those encountered in Canada. Differences in international regulations can be explained by differences in the use, manufacturing and importation of chemicals; in the case of pesticides, differences in registration status, application rates and geographical patterns of use also influence the regulations for drinking water quality.

Since Canadian regulatory needs differ from those of other international jurisdictions, international regulatory considerations were not considered in determining the appropriateness of the above mentioned GCDWQ within the Canadian context.

Part A. Withdrawal of Select Guidelines for Canadian Drinking Water Quality

A.1 Guideline development and review process

The *Guidelines for Canadian Drinking Water Quality* (GCDWQ) are developed by Health Canada in collaboration with the Federal-Provincial-Territorial Committee (CDW) to protect the health of all Canadians by establishing maximum acceptable concentrations (MACs) for contaminants in drinking water. Each guideline is developed based on current, published scientific studies related to health effects and operational considerations and, in some cases, aesthetic effects. Health-based guidelines are established on the basis of comprehensive reviews of the known health effects associated with each contaminant, exposure levels and the availability of appropriate treatment and analytical technologies.

Health Canada, in collaboration with the CDW, generally establishes GCDWQ for chemical contaminants that meet the following criteria:

1. Exposure to the contaminant could lead to adverse health effects;
2. The contaminant is frequently detected, or could be expected to be found, in a large number of drinking water supplies throughout Canada; and
3. The contaminant is detected, or could be expected to be detected, at a level that could potentially pose a risk to human health.

As part of the prioritization process for guideline development, Health Canada periodically assesses the available information on existing chemical drinking water guidelines to determine whether they are relevant in the current Canadian context and whether they should be updated or withdrawn. This review incorporates information from the current scientific literature as well as Canadian drinking water monitoring data. In the case of pesticides, additional information such as Canadian sales data, registration status and current acceptable daily intake (ADI) values, as established by Health Canada's Pest Management Regulatory Agency (PMRA), are also considered.

The GCDWQ are developed on an assessment of the hazard (the inherent toxicity of a chemical) and the risk of adverse health effects associated with exposure to chemical contaminants in drinking water. This is done to determine an acceptable level to which the general population, or susceptible subpopulations, can be exposed over a lifetime (considered to be 70 years) with no adverse health impacts expected. This acceptable level is known as the MAC.

A.2 Proposed withdrawal of select guidelines

As provinces and territories are generally responsible for drinking water quality in their jurisdiction, they each determine how they use the GCDWQ to address their specific needs. In some provinces and territories, health-based GCDWQ are automatically adopted by reference, thereby creating an obligation to monitor for these drinking water contaminants. Drinking water monitoring data from the provinces and territories are used as an indicator of the actual exposure of Canadians to chemical contaminants in drinking water. Over time, a guideline may no longer be needed, as science demonstrates that adverse health effects occur at levels much higher that were previously assessed. In the case of pesticides, this could also include a change in registration status. The withdrawal of a GCDWQ would remove the need or obligation of provinces and territories to routinely monitor for the given contaminant, thus allowing Canadian jurisdictions to

focus their efforts on contaminants that continue to be a concern for human health.

Based on current information, Health Canada, in collaboration with the CDW, is proposing to withdraw the GCDWQ for:

- 1,2-dichlorobenzene
- 2,4-dichlorophenol
- 2,3,4,6-tetrachlorophenol
- azinphos-methyl
- carbaryl
- carbofuran
- chlorpyrifos
- diazinon
- diclofop-methyl
- diuron
- metolachlor
- monochlorobenzene
- paraquat
- phorate
- picloram
- simazine
- terbufos
- trifluralin

In the event that any of these contaminants are detected in a drinking water supply, mechanisms are in place for Health Canada to provide up-to-date guidance to federal departments, provinces or territories to help address a specific need or situation, such as a spill.

Part B. Key Information Supporting Proposed Withdrawals

Table 1 provides a list of the pesticides that have been phased out and are no longer expected to be found in water. For the chemical contaminants identified in Table 2 and Table 3, monitoring data provided by the provinces and territories indicate that they are rarely found in drinking water, and only at levels well below their respective MACs. Based on this information, select GCDWQ are no longer required because these contaminants are unlikely to be found in Canadian drinking water at levels that may pose a risk to human health.

Table 1. Phased-out pesticides

Parameter	MAC (mg/L) (date established)	Key health endpoint	Year phased out
Azinphos-methyl	0.02 (Health Canada, 1989b)	Decreased plasma cholinesterase in rats	2006
Carbofuran	0.09 (Health Canada, 1991a)	Cholinesterase inhibition and growth suppression in rats	2010
Diclofop-methyl	0.009 (Health Canada, 1987a)	Liver effects in rats and mice	2011
Metolachlor[1]	0.05 (Health Canada, 1986a)	Male rat reproductive effects	2006
Terbufos	0.001 (Health Canada, 1987b)	Cholinesterase inhibition in dogs	2012

[1] Metolachlor only; does not include S-metolachlor or R-metolachlor

Table 2. Registered pesticides unlikely to be found in drinking water at levels that could lead to adverse health effects. Canadian monitoring data indicate that exposure from drinking water is rare, and when detected, levels are well below the MAC.

Parameter	MAC (mg/L) (reference)	Key health endpoint; Acceptable Daily Intakes (ADI) / Negligible Daily Intake (NDI) used to derive MAC; New ADI (mg/kg bw per day)	Sales of Active Ingredient (AI) in Canada (kg) (PMRA, 2014)	Maximum level detected[1] (mg/L)
Carbaryl	0.09 (Health Canada, 1991b)	Effects on the kidney in humans; ADI = 0.01; New ADI = 0.011 (PMRA, 2009a)	>50,000	0.00018
Chlorpyrifos	0.09 (Health Canada, 1986b)	Cholinesterase inhibition in dogs, rats and humans; ADI = 0.01; New ADI = 0.01 (PMRA, 2003)	>100,000	0.00012
Diazinon[2]	0.02 (Health Canada, 1986c)	Cholinesterase inhibition in dogs and humans; ADI = 0.002; New ADI = 0.0002	<50,000	0.00043

Parameter	MAC (mg/L) (reference)	Key health endpoint; Acceptable Daily Intakes (ADI) / Negligible Daily Intake (NDI) used to derive MAC; New ADI (mg/kg bw per day)	Sales of Active Ingredient (AI) in Canada (kg) (PMRA, 2014)	Maximum level detected[1] (mg/L)
		(PMRA, 2005)		
Diuron	0.15 (Health Canada, 1987c)	Body weight loss, increased liver weight, erythroid hyperplasia and decreased haematological values in dogs; ADI = 0.0156; New ADI = 0.003 (PMRA, 2006)	>50,000	0.001
Paraquat	0.01 (Health Canada, 1986d)	Decreased body weight and internal organ weights; effects on the lungs and kidneys in rats and dogs; ADI = 0.001; New ADI = 0.0045 (PMRA, 2004)	<50,000	0.0065
Phorate	0.002 (Health Canada, 1986e)	Cholinesterase inhibition in dogs and rats; ADI = 0.0002; New ADI = 0.00025 (PMRA, 2003)	>50,000	0.0013
Picloram	0.19 (Health Canada, 1988)	Changes in liver and body weight and clinical parameters in rats; NDI = 0.02; New ADI = 0.2 (PMRA, 2007)	<50,000	0.00006
Simazine	0.01 (Health Canada, 1986f)	Reduced body weight, increased serum alkaline phosphatase glutamic–oxaloacetic and slight hyperplasia of the thyroid gland in dogs; NDI = 0.0013; New ADI = 0.0018 (PMRA, 2009b)	<50,000	0.00005
Trifluralin	0.045 (Health Canada, 1989c)	Changes in liver and spleen weights and serum chemistry in dogs; NDI = 0.0048; New ADI = 0.024 (PMRA, 2008b)	>100,000	0.00019

[1]Based on monitoring data provided by members of the Federal-Provincial-Territorial Committee on Drinking Water; Prince Edward Island Department of Communities, Land and Environment (2015); Newfoundland and Labrador Department of Environment and Conservation (2015); New Brunswick Department of Health (2015); Nova Scotia Environment (2015);

Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (2015); Ontario Ministry of the Environment (2015); Manitoba Conservation and Water Stewardship (2015); Saskatchewan Water Security Agency (2015); Alberta Environment (2015); Government of Yukon (2015); and Government of Nunavut (2014).

[2] Diazinon: Most uses were phased out by 2016, with the exception of soil drench and ear tag applications.

Table 3. Other chemicals unlikely to be found in drinking water at levels that could lead to adverse health effects. Canadian monitoring data indicate that exposure from drinking water is rare, and when detected, levels are well below the MAC.

Parameter	MAC (mg/L) (date established)	Key health endpoint; ADI used to derive MAC (mg/kg bw per day)	Common releases to water	Maximum level detected [1] (mg/L)
1,2-dichlorobenzene	0.2 (Health Canada, 1987d)	Changes in serum cholesterol, protein and glucose in rats; ADI = 0.021	Releases or spills from industrial effluents	0.0002
2,4-dichlorophenol	0.9 (Health Canada, 1987e)	Slight changes in liver histopath-ology in male mice; ADI = 0.1	By-product of drinking water disinfection with chlorine; releases from industrial effluents	0.0007
2,3,4,6-tetrachloro-phenol	0.1 (Health Canada, 1987f)	Embryotoxicity in rats; ADI = 0.01	By-product of drinking water disinfection with chlorine; industrial effluents and use of pesticides	0.0004
Mono-chlorobenzene	0.08 (Health Canada, 1987g)	Reduced survival and body weight gain; liver and kidney effects in mice and rats; ADI = 0.0089	Releases or spills from industrial effluents	0.00025

[1]Based on monitoring data provided by members of the Federal-Provincial-Territorial Committee on Drinking Water; Prince Edward Island Department of Communities, Land and Environment (2015); Newfoundland and Labrador Department of Environment and Conservation (2015); New Brunswick Department of Health (2015); Nova Scotia Environment (2015); Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (2015); Ontario Ministry of the Environment (2015); Manitoba Conservation and Water Stewardship (2015); Saskatchewan Water Security Agency (2015); Alberta Environment (2015); Government of Yukon (2015); and Government of Nunavut (2014).

Part C. References and acronyms

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C.2 List of acronyms

ADI	acceptable daily intake
AI	active ingredient
CDW	Federal-Provincial-Territorial Committee on Drinking Water
GCDWQ	Guidelines for Canadian Drinking Water Quality
MAC	maximum acceptable concentration
NDI	negligible daily intake
PMRA	Pest Management Regulatory Agency
U.S. EPA	United States Environmental Protection Agency
WHO	World Health Organization