NOVA SCOTIA
Environment and Labour

A GUIDE FOR MUNICIPAL WATER WORKS ON HOW THE *GUIDELINES FOR CANADIAN DRINKING WATER QUALITY* ARE IMPLEMENTED IN NOVA SCOTIA

Introduction

Recognizing that safe drinking water is a core public health issue, the Nova Scotia government adopted the health-related *Guidelines for Canadian Drinking Water Quality* (GCDWQ), as legally binding standards in October 2000. The GCDWQ are amended from time to time by the Federal/Provincial/Territorial Committee on Drinking Water and published on the Health Canada website. The GCDWQ set out the basic parameters that every water system should strive to achieve in order to provide the cleanest, safest, and most reliable drinking water possible.

The most important drinking water quality guidelines deal with microbiological quality, to ensure there is minimal risk of exposure to disease-causing organisms in drinking water. The *Guidelines for Canadian Drinking Water Quality* include bacteriological parameters (total coliforms and *E.coli*), protozoa, and viruses.

Turbidity, while not a microbiological parameter *per se*, is considered an important surrogate measure of microbiological quality for surface water sources, or groundwater under the direct influence of surface water, because increased turbidity may be associated with a contamination episode and because turbidity may interfere with disinfection.

Health-based guidelines have been developed for a number of chemical and physical substances that are found in drinking water supplies across Canada. Disinfection by-products (DBPs) are an important parameter to consider because utilities must balance effective disinfection for microbiological protection against the creation of DBPs. Minimising DBPs to meet regulatory requirements will often restrict treatment process selection, and must be taken into account when new plants/upgrades/improvements are being considered.

Aesthetic and operational guidelines have also been developed as part of the *Guidelines for Canadian Drinking Water Quality*. These guidelines address parameters which may affect consumer acceptance of the water. These parameters generally affect characteristics such as taste, odour, and colour.

The purpose of this document is to provide information on the parameters that are health-related and legally enforceable standards In Nova Scotia. Information is also provided for non-health-related parameters that have aesthetic or operational guidelines but which are not legally enforceable unless they compromise disinfection or another treatment process.

Types of Standards and Guidelines

This document addresses the following types of health-related standards:

- **Maximum Acceptable Concentration (MAC)**
  The MAC is established for parameters which when present above a certain concentration, have known or suspected adverse health effects. The length of time that the MAC can be exceeded without health effects will depend on the nature and concentration of the parameter.

- **Interim Maximum Acceptable Concentration (IMAC)**
  The IMAC is established for parameters either when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not feasible, for practical reasons, to establish a MAC at the desired level.

This document also addresses the following types of non-health-related guidelines:

- **Aesthetic Objective (AO)**
  AOs are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practises. For certain parameters, both aesthetic objectives and health-related MACs have been derived (see Table 2).

- **Operational Guidelines (OG)**
  OGs are established for parameters that, if not controlled, may negatively affect the efficient and effective treatment, disinfection, and distribution of water.

Microbiological parameters are discussed in Appendix A, and chemical/physical parameters are discussed in Appendix B. Aesthetic objectives and operational guidelines are listed in Appendix C.

The drinking water standards and guidelines outlined in this document should be interpreted using the supporting documentation available on the Health Canada website (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index_e.html). The supporting documentation contains the scientific and management information used to determine the concentrations required to adequately protect human health or the aesthetic quality of the water.

Where limits are provided for substances listed in the *Guidelines for Canadian Drinking Water Quality*, this should in no way be regarded as implying that allowing the degradation of a high quality water supply to the specified level or range is acceptable.

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APPENDIX A
Microbiological Health-Related Standards

Table A-1 - Bacteria, Protozoa and Viruses [1]

Parameter	Standard
Total coliform	none per 100 mL
Escherichia coli (E. coli)	none per 100 mL
Protozoa (*Giardia* and *Cryptosporidium*) [2]	3-log reduction
Viruses [3]	4-log reduction

Notes:

1. Until the Nova Scotia Treatment Standards are met in April 2008, the following municipal public drinking water supplies are required to sample twice weekly: surface water supply with no treatment other than disinfection; surface water supply with inadequate or malfunctioning treatment as determined by the Regional Engineer; groundwater supply that can not meet the Groundwater Treatment Standard as determined by the Regional Engineer.

2. The *Guidelines for Canadian Drinking Water Quality* state that "Although *Giardia* and *Cryptosporidium* can be responsible for severe and, in some cases, fatal gastrointestinal illness, it is not possible to establish maximum acceptable concentrations (MACs) for these protozoa in drinking water at this time. Routine methods available for the detection of cysts and oocysts suffer from low recovery rates and do not provide any information on their viability or human infectivity. Nevertheless, until better monitoring data and information on the viability and infectivity of cysts and oocysts present in drinking water are available, measures should be implemented to reduce the risk of illness as much as possible. If the presence of viable, human-infectious cysts or oocysts is known or suspected in source waters, or if *Giardia* or *Cryptosporidium* has been responsible for past waterborne outbreaks in a community, a treatment and distribution regime and a watershed or wellhead protection plan (where feasible) or other measures known to reduce the risk of illness should be implemented. Treatment technologies in place should achieve at least a 3-log reduction in and/or inactivation of cysts and oocysts, unless source water quality requires a greater log reduction and/or inactivation."

   To reduce the risk of illness, Nova Scotia has established a treatment standard that requires municipal public drinking water supplies using surface water sources or groundwater under the direct influence of surface water (GUDI) to provide treatment that is sufficient to ensure 3-log reduction (99.9%) of *Giardia*. Disinfection must address a minimum of 0.5 log reduction when used in conjunction with filtration. The surface water treatment standard is available on the web at: http://www.gov.ns.ca/enla/water/municipalwaterapproval.asp.

3. The *Guidelines for Canadian Drinking Water Quality* state that "Although enteric viruses can be responsible for severe and, in some cases, fatal illnesses, it is not possible to establish maximum acceptable concentrations (MACs) for enteric viruses in drinking water at this time. Treatment technologies and watershed or wellhead protection measures known to reduce the risk of waterborne outbreaks should be implemented and maintained if source water is subject to faecal contamination or if enteric viruses have been responsible for past waterborne outbreaks. Where treatment is required, treatment technologies should achieve at least a 4-log reduction and/or inactivation of viruses."

   To reduce the risk of illness, Nova Scotia has established a treatment standard that requires all municipal public drinking water supplies to provide treatment that is sufficient to ensure 4-log reduction (99.99%) of viruses. The surface and groundwater treatment standards are on the web at: http://www.gov.ns.ca/enla/water/municipalwaterapproval.asp.

TABLE A-2 - Disinfection and Turbidity Standards Associated with Microbiological Protection

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
Bromate [1]	0.01 [1]		
Chloramines (total) [2]	3 [2]		
Chlorine Residual [3]	0.2 - 4.0 [3]		
Chlorite/Chlorate [4]	Under development [4]		
Haloacetic Acids (HAAs) [5]	Under development [5]		
Total Trihalomethanes [6] (THMs) – Bromodichloromethane (BDCM) [7]	0.1 [6] 0.016 [7]		
Turbidity [8, 9]	0.2 - 1.0 [8]		5 NTU [9]

Short Forms:

AO - Aesthetic Objective
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
mg/L - milligrams per litre
NTU - Nephelometric Turbidity Unit

Notes:

1. Bromate only needs to be tested for public drinking water supplies that use ozone as a disinfectant.
2. Chloramines only needs to be tested for public drinking water supplies that use chloramination as a disinfectant.
3. Minimum and maximum chlorine residual values are outlined in the *Guidelines for Monitoring Public Drinking Water Supplies.* The minimum free chlorine residual goal of 0.2 mg/L is mandatory for municipal public drinking water supplies as it is stipulated in the Approval to Operate. Furthermore, the minimum free chlorine residual requirement has been increased to 0.4 mg/L in Approvals to Operate for the following municipal public drinking water supplies: surface water supply with no treatment other than disinfection; surface water supply with inadequate or malfunctioning treatment as determined by the Regional Engineer; or groundwater supply that can not meet the *Groundwater Treatment Standard* as determined by the Regional Engineer. Municipal approvals require that all incidents of free chlorine residual below the stipulated amount in the distribution system (e.g. 0.2 mg/L or 0.4 mg/L) must: be documented with description of any actions taken and reported to Nova Scotia Environment and Labour (NSEL); and be recorded and the records kept for a minimum of five years. The Approval to Operate will take precedence over the *Guidelines for Monitoring Public Drinking Water Supplies*.
4. Guidelines are under development for chlorite/chlorate. Chlorite and chlorate are disinfection by-products that are formed when using chlorine dioxide as a disinfectant. Chlorate can also be formed when using sodium hypochlorite that does not meet quality standards or that has been stored for a long period.
5. Guidelines are under development for haloacetic acids (HAAs). HAAs are disinfection by-products that are formed when using chlorine as a disinfectant.
6. The MAC for total trihalomethanes is based on a locational running annual average of a minimum of quarterly samples taken at the point in the distribution system with the highest potential THM levels. This usually occurs at the extremities of the distribution system. Although the use of chlorine can lead to the formation of disinfection by-products such as THMs, efforts to manage THM levels **must not** compromise the effectiveness of disinfection.
7. Although BDCM is a component of total THMs, a specific MAC for BDCM was set in May 2006 because brominated by-products have consistently been shown to be more toxic than chlorinated by-products. The MAC for BDCM in drinking water is 0.016 mg/L monitored at the point in the distribution system with the highest potential THM levels. This parameter is **not** to be averaged into a locational running annual average.
8. For treated surface water supplies and GUDI wells, turbidity levels of 0.2 NTU in drinking water leaving the treatment plant must be achieved at least 95 percent of the time based on each calendar month and taken by continuous monitoring equipment. For secure groundwater supplies, turbidity levels must not exceed 1.0 NTU in at least 95 percent of measurements taken by grab sampling or 95 percent of the time each calendar month if continuous monitoring equipment is used. For secure groundwater supplies that exceed 1.0 NTU for water entering a distribution system or pipeline, a maximum of 5.0 NTU may be permitted if the owner demonstrates that the turbidity is not health-related and that the disinfection process is not compromised by the use of this less stringent value.
9. Distribution system processes can result in increased turbidity in the distribution system. To ensure that the aesthetic quality is not degraded, an aesthetic objective for turbidity at the point of consumption has been set at 5 NTU.

Table A-3 - Additional Information on Turbidity and Disinfection Requirements

Turbidity

Turbidity is a strong indicator of water quality. It is also an important indicator of treatment efficiency and filter performance in particular.

Turbidity in water is caused by suspended and colloidal matter such as clay, silt, fine organic and inorganic matter, and plankton and other microscopic organisms. Control of turbidity in water supplies is important for both health and aesthetic reasons. Water that has high levels of turbidity is not only unappealing to the consumer, but the substances and particles that cause turbidity can interfere with disinfection and can be a source of disease-causing organisms.

The most recent Canadian guidelines for turbidity (October 2003) states that waterworks systems that use a surface water source or groundwater under the direct influence of surface water (GUDI) should filter the water to reduce the level of turbidity to as low as reasonably achievable.

a) **Guidance for surface water or GUDI sources** - Water that passes through each filter is to be continuously monitored to make sure the filters are operating properly and to determine when backwashing is necessary. Micro-organisms concentrate on filters and breakthrough could result in contaminated water reaching consumers. Turbidity levels of 0.2 NTU in water leaving individual filters must be achieved at least 95 percent of the time based on each calendar month. The combined filter effluent leaving the treatment plant must also be monitored by continuous monitoring equipment.

b) **Guidance for secure groundwater sources** - For secure groundwater supplies, turbidity levels must not exceed 1.0 NTU in at least 95 percent of measurements taken by grab sampling or 95 percent of the time each calendar month if continuous monitoring equipment is used. For secure groundwater supplies that exceed 1.0 NTU for water entering a distribution system or pipeline, a maximum of 5.0 NTU may be permitted if the owner demonstrates that the turbidity is not health-related and that the disinfection process is not compromised by the use of this less stringent value.

Disinfection

Municipal public drinking water supplies should be disinfected to ensure the safety of the drinking water supply. The effectiveness of primary disinfection can be predicted based on knowledge of the residual concentration of disinfectant, temperature, pH, and the time between the moment the disinfectant is added to the water and the moment the water arrives to the first customer. This relationship is commonly referred to as the “contact time” or “CT” concept. CT is the product of C (the residual concentration of disinfectant, measured in mg/L) and T (the disinfectant contact time, measured in minutes). This calculation is used as a tool for ensuring adequate inactivation of organisms during disinfection. ***C-T tables can be found within each treatment standard.*** A boil water advisory is required when primary disinfection is ineffective or disinfection equipment fails.

In addition, a disinfectant residual should be present at all times in the distribution system. Chlorine residuals should be tested when bacteriological samples are taken in the distribution system. Corrective action is required when chlorine residuals in the distribution system drop below the amounts stipulated in the Approval to Operate (e.g. 0.2 mg/L or 0.4 mg/L).

Continuous chlorine residual monitoring is required at the plant/well and storage tanks per the treatment standards.

APPENDIX B
Chemical and Physical Health-Related Standards

Table B-1 - Guidelines for Monitoring Public Drinking Water Supplies [1]

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
Alkalinity			
Aluminum [2]	0.1 - 0.2 [2]		
Ammonia			
Antimony [3]		0.006 [3]	
Arsenic [4]		0.010 [4]	
Barium	1		
Boron	5		
Cadmium	0.005		
Calcium			
Chloride			≤250
Chromium	0.05		
Colour			≤15 TCU
Conductivity			
Copper [3]			≤1.0 [3]
Fluoride [5]	1.5 [5]		
Hardness			
Iron			≤0.3
Lead [3]	0.010 [3]		
Magnesium			
Manganese			≤0.05
Nitrate - Nitrogen [6]	10 [6]		
pH			6.5–8.5 (no units)
Potassium			
Selenium	0.01		
Sodium [7]			≤200 [7]
Sulphate [8]			≤500 [8]
Total Dissolved Solids			≤ 500
Total Organic Carbon			
Turbidity [9, 10]	0.2 - 1.0 [9]		5 NTU [10]
Uranium	0.02		
Zinc			≤5.0

Short Forms:

AO - Aesthetic Objective
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
mg/L - milligrams per litre
NTU - Nephelometric Turbidity Unit

Notes:

1. Minimum sampling frequency per the *Guidelines for Monitoring Public Drinking Water Supplies* is once per year for surface water supplies and once every two years for groundwater supplies unless otherwise noted (e.g. turbidity). An Approval to Operate (and associated approved sampling plan) will always take precedence over the *Guidelines*. Sampling frequency is enforceable per Section 33 of the *Water and Wastewater Facilities and Public Drinking Water Supplies Regulations*. Corrective action is enforceable for parameters with a MAC/IMAC per Section 34 of the *Water and Wastewater Facilities and Public Drinking Water Supplies Regulations*. Sampling for all parameters with a MAC/IMAC (see Table B-2) is enforceable per Section 35 of the *Water and Wastewater Facilities and Public Drinking Water Supplies Regulations*. Non-health-related parameters are tested to fully characterize the water source.
2. Until a health-based standard for aluminum is set, municipal water approvals require water treatment plants using aluminium-based coagulants to reduce residual aluminium levels in treated water to the lowest extent possible as a precautionary measure. Values of less than 0.1 mg/L total aluminium for conventional treatment plants and less than 0.2 mg/L total aluminium for other types of treatment systems have been set. Any attempt to minimize aluminum residuals must not compromise the effectiveness of disinfection process or interfere with the removal of disinfection by-product precursors.
3. Because first-drawn water may contain higher concentrations of metals than are found in running water after flushing, faucets should be thoroughly flushed before water is taken for consumption or analysis.
4. The arsenic guideline was reduced to 0.01 mg/L (10 µg/L) in May 2006.
5. The maximum acceptable concentration for naturally occurring fluoride is 1.5 mg/L. Where fluoride is added for the control of dental caries, it is recommended that the concentration of fluoride be adjusted to the optimum range of 0.8 - 1.0 mg/L.
6. The Health Canada documentation indicates that the maximum acceptable concentration for nitrate is 45 mg/L. This is equivalent to 10 mg/L as nitrate-nitrogen. Concentrations of nitrate and nitrite in drinking water are often expressed in the literature in units of nitrate-nitrogen and nitrite-nitrogen respectively, as follows: 1 mg nitrate-nitrogen/L = 4.43 mg nitrate/L and 1 mg nitrite-nitrogen/L = 3.29 mg nitrite/L. As such, the 10 mg/L as nitrate-nitrogen is specified in this document. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L or 1.0 mg/L as nitrite-nitrogen. Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).
7. It is recommended that sodium be included in routine monitoring programs, as levels may be of interest to authorities who wish to prescribe sodium-restricted diets for their patients.
8. There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
9. For treated surface water supplies and GUDI wells, turbidity levels of 0.2 NTU in drinking water leaving the treatment plant must be achieved at least 95 percent of the time based on each calendar month and taken by continuous monitoring equipment. For secure groundwater supplies, turbidity levels must not exceed 1.0 NTU in at least 95 percent of measurements taken by grab sampling or 95 percent of the time each calendar month if continuous monitoring equipment is used. For secure groundwater supplies that exceed 1.0 NTU for water entering a distribution system or pipeline, a maximum of 5.0 NTU may be permitted if the owner demonstrates that the turbidity is not health-related and that the disinfection process is not compromised by the use of this less stringent value.
10. Distribution system processes can result in increased turbidity in the distribution system. To ensure that the aesthetic quality is not degraded, an aesthetic objective for turbidity at the point of consumption has been set at 5 NTU.

Table B-2 - Baseline Chemical Analysis[1]

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
aldicarb	0.009		
aldrin + dieldrin	0.0007		
aluminum [2]		0.1-0.2 [2]	
antimony [3]		0.006 [3]	
arsenic [4]		0.010 [4]	
atrazine + metabolites		0.005	
azinphos-methyl	0.02		
barium	1		
bendiocarb	0.04		
benzene	0.005		
benzo[a]pyrene	0.00001		
boron		5	
bromate [5]		0.01 [5]	
bromoxynil		0.005	
cadmium	0.005		
carbaryl	0.09		
carbofuran	0.09		
carbon tetrachloride	0.005		
chloramines (total) [6]	3 [6]		
chlorpyrifos	0.09		
chromium	0.05		
cyanazine		0.01	
cyanide	0.2		
cyanobacterial toxins (as microcystin-LR) [7]	0.0015 [7]		
diazinon	0.02		
dicamba	0.12		
dichlorobenzene, 1,2- [8]	0.20 [8]		$\leq$0.003
dichlorobenzene, 1,4- [8]	0.005 [8]		$\leq$0.001
dichloroethane, 1,2-		0.005	
dichloroethylene, 1,1-	0.014		
dichloromethane	0.05		
dichlorophenol, 2,4-	0.9		$\leq$0.0003
dichlorophenoxyacetic acid, 2,4- (2,4-D)		0.1	

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
diclofop-methyl	0.009		
dimethoate		0.02	
dinoseb	0.01		
diquat	0.07		
diuron	0.15		
fluoride[9]	1.5 [9]		
glyphosate		0.28	
lead [3]	0.01 [3]		
malathion	0.19		
mercury	0.001		
methoxychlor	0.9		
metolachlor		0.05	
metribuzin	0.08		
monochlorobenzene	0.08		$\leq$0.03
nitrate - nitrogen [10]	10 [10]		
nitrilotriacetic acid (NTA)	0.4		
paraquat (as dichloride) [11]		0.01[11]	
parathion	0.05		
pentachlorophenol	0.06		$\leq$0.030
phorate	0.002		
picloram		0.19	
selenium	0.01		
simazine		0.01	
terbufos		0.001	
tetrachloroethylene	0.03		
tetrachlorophenol, 2,3,4,6-	0.1		$\leq$0.001
trichloroethylene [12]	0.005 [12]		
trichlorophenol, 2,4,6-	0.005		$\leq$0.002
trifluralin		0.045	
total trihalomethanes (total) [13] - bromodichloromethane [14]		0.1 [13] 0.016 [14]	
turbidity [15, 16]	0.2 -1 NTU [15]		$\leq$5 NTU [16]
uranium		0.02	
vinyl chloride	0.002		

Short Forms:

AO - Aesthetic Objective
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
mg/L - milligrams per litre
NTU - Nephelometric Turbidity Unit

Notes:

1. Sampling for all parameters with a health-related parameter (MAC/IMAC) is enforceable per Section 35 of the *Water and Wastewater Facilities and Public Drinking Water Supplies Regulations*.
2. Until of a health-based standard for aluminium is set, municipal water approvals require water treatment plants using aluminium-based coagulants to reduce residual aluminium levels in treated water to the lowest extent possible as a precautionary measure. Values of less than 0.1 mg/L total aluminium for conventional treatment plants and less than 0.2 mg/L total aluminum for other types of treatment systems have been set. Any attempt to minimize aluminum residuals must not compromise the effectiveness of disinfection process or interfere with the removal of disinfection by-product precursors.
3. Because first-drawn water may contain higher concentrations of metals than are found in running water after flushing, faucets should be thoroughly flushed before water is taken for consumption or analysis.
4. The arsenic guideline was dropped from 0.025 mg/L to 0.010 mg/L in May 2006.
5. Bromate only needs to be tested for public drinking water supplies that use ozone as a disinfectant.
6. Chloramines only needs to be tested for public drinking water supplies that use chloramination as a disinfectant
7. Only applies to surface water supplies and should be tested in the summer. The guideline is considered protective of human health against exposure to other microcystins (total microcystins) that may also be present.
8. In cases where total dichlorobenzenes are measured and concentrations exceed the most stringent value (0.005 mg/L), the concentrations of the individual isomers should be established.
9. The maximum acceptable concentration for naturally occurring fluoride is 1.5 mg/L. Where fluoride is added for the control of dental caries, it is recommended that the concentration of fluoride be adjusted to the optimum range of 0.8 - 1.0 mg/L.
10. The Health Canada documentation indicates that the maximum acceptable concentration for nitrate is 45 mg/L. This is equivalent to 10 mg/L as nitrate-nitrogen. Concentrations of nitrate and nitrite in drinking water are often expressed in the literature in units of nitrate-nitrogen and nitrite-nitrogen respectively, as follows: 1 mg nitrate-nitrogen/L = 4.43 mg nitrate/L and 1 mg nitrite-nitrogen/L = 3.29 mg nitrite/L. As such, the 10 mg/L as nitrate-nitrogen is specified in this document. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L or 1.0 mg/L as nitrite-nitrogen. Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).
11. Equivalent to 0.007 mg/L for paraquat ion.
12. The trichloroethylene guideline was dropped from 0.05 mg/L to 0.005 mg/L in July 2005.
13. The MAC for total trihalomethanes is based on a locational running annual average of a minimum of quarterly samples taken at the point in the distribution system with the highest potential THM levels. This usually occurs at the extremities of the distribution system. Although the use of chlorine can lead to the formation of disinfection by-products such as THMs, efforts to manage THM levels **must not** compromise the effectiveness of disinfection.
14. Although BDCM is a component of total THMs, a specific MAC for BDCM was set in May 2006 because brominated by-products have consistently been shown to be more toxic than chlorinated by-products. The MAC for BDCM in drinking water is 0.016 mg/L monitored at the point in the distribution system with the highest potential THM levels. This parameter is **not** to be averaged into a locational running annual average.
15. For treated surface water supplies and GUDI wells, turbidity levels of 0.2 NTU in drinking water leaving the treatment plant must be achieved at least 95 percent of the time based on each calendar month and taken by continuous monitoring equipment. For secure groundwater supplies, turbidity levels must not exceed 1.0 NTU in at least 95 percent of measurements taken by grab sampling or 95 percent of the time each calendar month if continuous monitoring equipment is used. For secure groundwater supplies that exceed 1.0 NTU for water entering a distribution system or pipeline, a maximum of 5.0 NTU may be permitted if the owner demonstrates that the turbidity is not health-related and that the disinfection process is not compromised by the use of this less stringent value.
16. Distribution system protection processes can result in increased turbidity in the distribution system. To ensure that the aesthetic quality is not degraded, an aesthetic objective for turbidity at the point of consumption has been set at 5 NTU.

APPENDIX C

Table C-1 - None Health-Related Guidelines (mg/L)

Parameter	Objective	Type of Objective
chloride	≤250	AO
colour	≤15 TCU	AO
copper [1]	≤1.0[1]	AO
ethylbenzene	≤0.0024	AO
iron	≤0.3	AO
manganese	≤0.05	AO
methyl *tertiary*-butyl ether (MTBE)	0.015	AO
odour	Inoffensive	AO
pH	6.5–8.5 (no units)	OG
sodium[2]	≤200[2]	AO
sulphate[3]	≤500[3]	AO
sulphide (as H_2S)	≤0.05	AO
taste	Inoffensive	AO
temperature	≤15^{0}C	AO
toluene	≤0.024	AO
total dissolved solids (TDS)	≤ 500	AO
xylenes (total)	≤0.3	AO
zinc[1]	≤5.0	AO

Short Forms:

AO - Aesthetic Objective
OG - Operational Guideline
mg/L - milligram per litre
TCU -True Colour Units

Notes:

1. Because first-drawn water may contain higher concentrations of metals than are found in running water after flushing, facets should be thoroughly flushed before water is taken for consumption or analysis.
2. It is recommended that sodium be included in routine monitoring programs, as levels may be of interest to authorities who wish to prescribe sodium-restricted diets for their patients.
3. There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.

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