

# ***Ontario's Drinking Water Quality Standards***

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**Presented to: DWQMS Workshop**

**April 2018 Barrie and Thunder Bay**

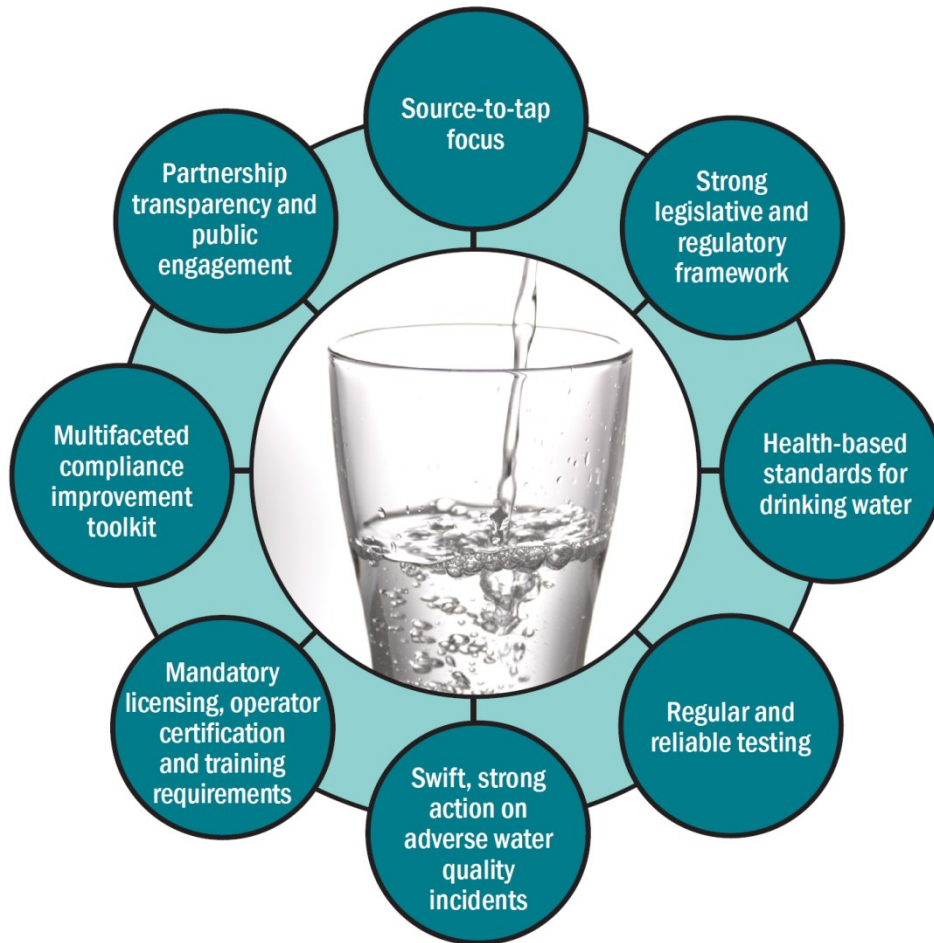
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# Purpose

To provide an overview of:

- Ontario Drinking Water Quality Standards
  - What are they and where do they reside in our Regulatory Regime?
  - What does a standard mean?
  - How are they developed?
- Regulatory Changes in the past 3 years
  - New and revised standards
  - Definition of quarterly sampling frequencies

# Drinking Water Safety Net



- Here is where Standards fit in the multi-barrier system
- It is important to note that standards form only one part of the multi-barrier system

# Principles used in developing Drinking Water Quality Standards

- Drinking water standards are established using generally accepted scientific principles that include peer-reviewed publications
- Health Canada has also developed a methodology to assess exposure to drinking water contaminants from dermal and inhalation routes
- Life-time exposures are considered in the development of drinking water standards
  - Carcinogenic substances are set for about  $10^{-5}$  to  $10^{-6}$  life-time risk
  - Non-carcinogenic substances are set so that drinking water accounts for about 20% of a reference dose (an amount that is considered generally acceptable over a life-time)
- Analytical capability and treatment technology are also considered

# What is a Standard?

- Although expressed as a numerical value in O. Regulation 169/03, a standard represents various aspects of the drinking water program
- It reflects practices related to source water selection, treatment technology, and monitoring
- Trends in the level of a given compound could be used to assess local threats hence mitigation measures even if the level does not exceed a prescribed standard
- Development of a standard considers more than a health basis

# Ontario Drinking Water Quality Standards

- Generally adopted from Canadian Drinking Water Quality Guidelines (CDWQGs) after public consultation via the Environmental Bill of Rights Environmental Registry
- CDWQGs are developed through a national process managed by federal, provincial and territorial government representatives
- Ontario may develop provincial standards when substances not identified as a national priority or when the approval date for a CDWQG does not meet Ontario's needs

# Ontario Drinking Water Quality Standards

- Legally enforceable under O. Reg. 169/03 as well as in Schedules 23 and 24 of 170/03
- Microbiological (2), chemical (70) and radiological parameters (78)
- Health Related
  - Maximum Acceptable Concentration (MAC) established using best available information
- Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines
  - Provides additional information on individual parameters
- Turbidity
  - Enforced as filter performance criteria in the “Procedure for Disinfection of Drinking Water in Ontario”

# Standard Setting Stages

- Standards setting consists of four major stages:

**Priority Setting:** Decisions made on priority for review of existing standards or development of new standards. New scientific information, potential health risks, frequency of occurrence and geographic scope are considered.

**Standards Development: Two Major Components:**

**Risk Assessment:** Scientific evaluation of the health effects or other impacts of exposure to a substance/organism.

Outcome: limit proposed protective of health

**Risk Management:** Evaluation of implementation issues - availability of testing methods, treatment technologies, implementation approach/timing, costs and health benefits.

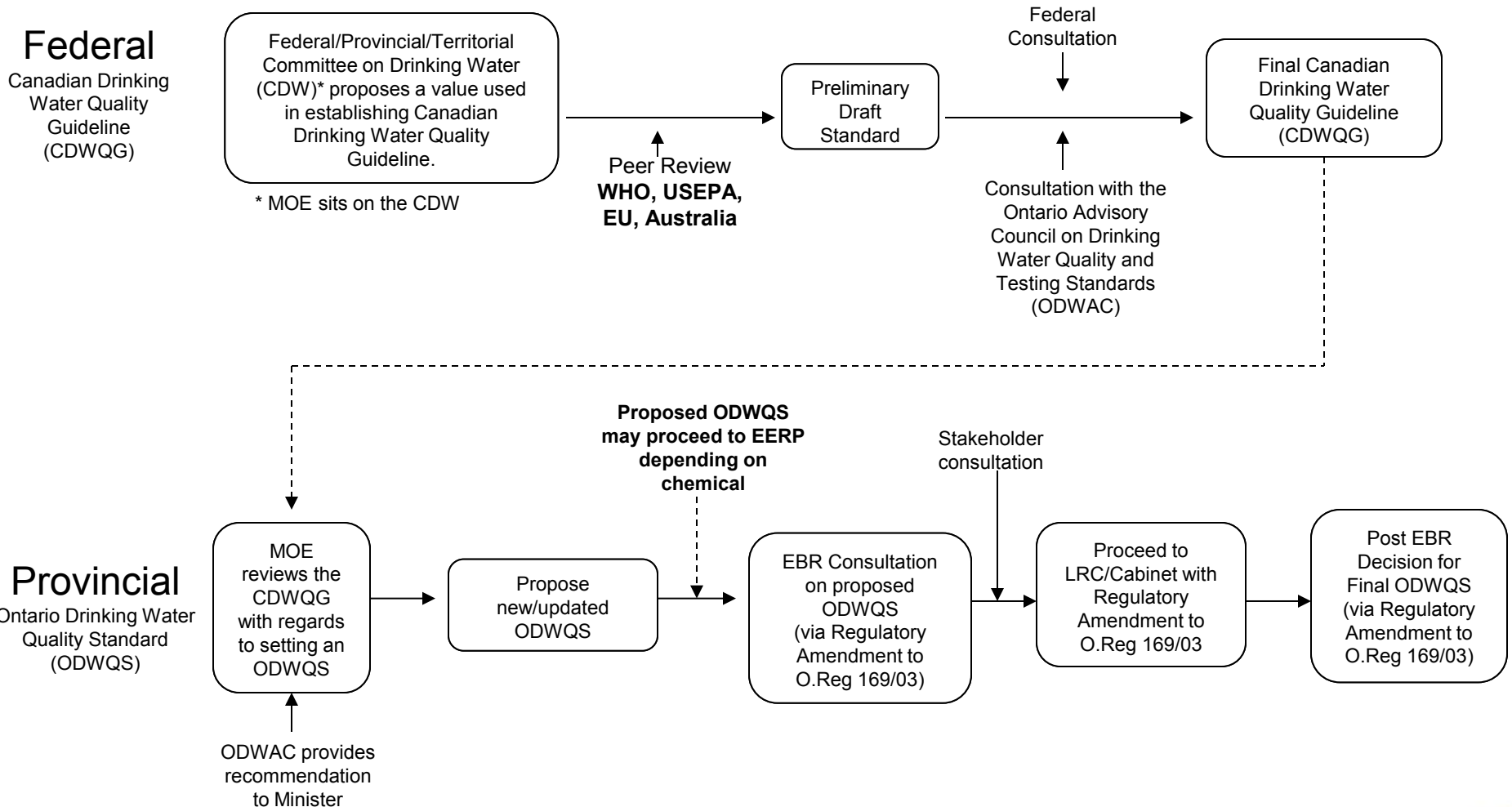
Outcome: proposed standard and implementation guidance

**Stakeholder Consultation:** Public are invited to review and comment on proposed standards and implementation guidance. Standards and implementation approaches may be modified in light of comments received, prior to adoption.

**Implementation:** Implementation plans may be revised based on consultation comments. In Ontario, standards are finalized and implemented by O.Reg. 169/03 amendment.



# STANDARD SETTING PROCESS



# Objectives and Guidelines

Listed in the “Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines”

- Aesthetic Objectives (AO)
  - set for parameters that may impair taste, odour, colour, or water quality e.g. copper, chloride, total dissolved solids
  - for certain chemicals a health standard and an aesthetic objective may be established e.g. 2,4-dichlorophenol, **0.9 mg/L(MAC)** and **0.003 mg/L(AO)**
- Operational Guidelines (OG)
  - established to ensure efficient and effective treatment objectives e.g. aluminum, alkalinity, pH

# Take-Aways

- A standard is more than a number
- Trends in the levels of a given compound over time might be an important clue for any future monitoring based on:
  - present treatment at the system;
  - forecasted housing development- capacity;
  - Degradation products of the compound (i.e. TCE to vinyl chloride)

## Amendments to O. Reg. 169/03

- The MOECC has carried out three consultations on the Environmental Bill of Rights Environmental Registry (EBR) for amending the Ontario Drinking Water Quality Standards as follows:
  - December 18, 2014 to February 16, 2015 (EBR 012-1594)
  - August 15, 2015 to September 28, 2015 (EBR 012-4213)
  - August 23, 2016 to October 07, 2016 (EBR 012-8244)

# Summary Table of EBR Consultations 012-1594 and 012-4213

Parameter (mg/L)	Previous Standard (mg/L)	Original EBR Consultation 012-1594 (mg/L)	Consequence of Consultation
Arsenic	0.025	0.010	Implementation date extended to January 1, 2018
Benzene	0.005	0.001	Adopted as an ODWQS July1, 2016
Carbon Tetrachloride	0.005	0.002	Adopted as an ODWQS July1, 2016
THMs	0.100	Maintain current standard of 0.100	No Change but clarified calendar quarters and calculations
Vinyl chloride	0.002	0.001	Adopted as an ODWQS July1, 2016
Haloacetic Acids (HAAs)	N/A	0.080	Implementation date extended to January 1, 2020
Chlorate/chlorite	N/A	1/1	Adopted as an ODWQS July1, 2016
2-methyl-4-chlorophenoxyacetic acid (MCPA)	N/A	0.1	Adopted as an ODWQS July1, 2016

# Summary Table of EBR Consultations 012- 8244

Parameter (mg/L)	Current Standard (mg/L)	EBR Consultation (mg/L)	Amendment to O. Reg. 163/03 to adopt/revoke these parameters as ODWQS
Selenium	0.01	0.05	July 1, 2017
Nitrate + Nitrite	10	Revoke	Revoked on July 1, 2017
Tetrachloroethylene	0.03	0.01	July 1, 2017
Toluene	NA	0.06	July 1, 2017
Ethylbenzene	NA	0.14	July 1, 2017
Xylene	NA	0.09	July 1, 2017
Methyl-t-butyl ether	NA	NA	July 1, 2017

# Removal of Legacy Pesticides

## EBR 012-4213

- To further reduce burden it was proposed that thirteen (13) 'legacy' pesticides be removed from regulations (O. Reg. 169/03 and O. Reg. 170/03). These pesticides, revoked on July 1, 2016, are no longer in commercial use, have been de-listed from the federal guidelines, and have not been detected in drinking water samples for at least 10 years:
  1. Aldicarb
  2. Aldrin + Dieldrin
  3. Bendiocarb
  4. Chlordane (Total)
  5. Cyanazine
  6. Dichlorodiphenyltrichloroethane (DDT) + metabolites
  7. Dinoseb
  8. Heptachlor + Heptachlor Epoxide
  9. Lindane (Total)
  10. Methoxychlor
  11. Parathion
  12. Temephos
  13. 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)
- These 'legacy' pesticides would continue to be monitored as part of pesticide scans done by the ministry (voluntary basis).

# Aesthetic Objectives

CHEMICAL	NEW AO (mg/L)	OLD AO (mg/L)	DATE	COMMENTS
Ethylbenzene-AO	0.0016	0.0024	July 1, 2017	More stringent
Methyl-t-butyl ether -AO	0.015	NA	July 1, 2017	New AO
Xylenes -AO	0.02	0.3	July 1, 2017	More stringent



# Calendar Quarter & Annual Average

- Definition of calendar quarter in Subsection 1(1) of 170/03; moving to defined time-lines for sampling and monitoring
- Annual average is now defined as the simple average of the calendar quarter sample results with respect to trihalomethanes

# Burden Reduction for THMs Reporting

- Small municipal residential system or a non-municipal year-round residential system may cease sampling for trihalomethanes for eight consecutive quarters if:
  - No single test result obtained in the previous 12 consecutive calendar quarters exceeds 0.050 mg/L (1/2 of the standard)
  - No change in raw water supply or treatment equipment that could impact water chemistry
  - No change in operating conditions (Direction) from the Director

# HAA's Sampling

- Sampling and monitoring for haloacetic acids is generally the same as for trihalomethanes
- An annual average is recorded by taking a simple average of the haloacetic acid levels in each calendar quarter

# Burden Reduction for HAAs Reporting

- Small municipal residential system or a non-municipal year-round residential system may cease sampling for haloacetic acids for eight consecutive quarters if:
  - No single test result obtained in the previous 12 consecutive calendar quarters exceeds 0.040 mg/L (1/2 of the standard)
  - No change in raw water supply or treatment equipment that could impact water chemistry
  - No change in operating conditions (Direction) from the Director

# Owner/ Laboratory Responsibilities

- Operating authorities / owners would be required to calculate a new running annual average and notify the existing authorities of any adverse test results within 7 days - there would no longer be a requirement to make contact by telephone
- Laboratories that upload every individual test result into the ministry's system within 48 hours would no longer have to calculate and report running annual averages as adverse test results

# Removal of Legacy Pesticides

- To further reduce burden it is proposed that thirteen (13) 'legacy' pesticides be removed from regulations (O. Reg. 169/03 and O. Reg. 170/03). These pesticides are no longer in commercial use, have been de-listed from the federal guidelines, and have not been detected in drinking water samples for at least 10 years:
  1. Aldicarb
  2. Aldrin + Dieldrin
  3. Bendiocarb
  4. Chlordane (Total)
  5. Cyanazine
  6. Dichlorodiphenyltrichloroethane (DDT) + metabolites
  7. Dinoseb
  8. Heptachlor + Heptachlor Epoxide
  9. Lindane (Total)
  10. Methoxychlor
  11. Parathion
  12. Temephos
  13. 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)
- These 'legacy' pesticides would continue to be monitored as part of pesticide scans done by the ministry (voluntary basis).

# Pesticides without Standards

- Historically, the detection of pesticides without standards in the drinking water would result in an Adverse Water Quality Incident (AWQI)
- As of July 1, 2017, the detection of these pesticides (i.e. without an ODWQS) will only result in an AWQI if the detected level is above 100 ng/L.
- However, the result (pesticide, level detected) is still uploaded to the ministry so we can assess if a standard is required

# Questions

1. How does this impact your QMS?
2. How can I prepare / be pro-active?
3. How can I communicate these changes to a non-technical audience (senior management / municipal council)?