

GUIDELINES FOR CANADIAN DRINKING WATER QUALITY (UPDATE)

Christa Skinner
Environmental Scientist
Water Resources Management Division
Department of Environment and Climate Change



OVERVIEW

- Drinking water quality monitoring
- Guidelines
- Recent updates/revisions
 - 2019: Manganese
 - 2019: Copper
 - 2019: Lead
- Exceedance Reporting
- Seasonal Community Updates



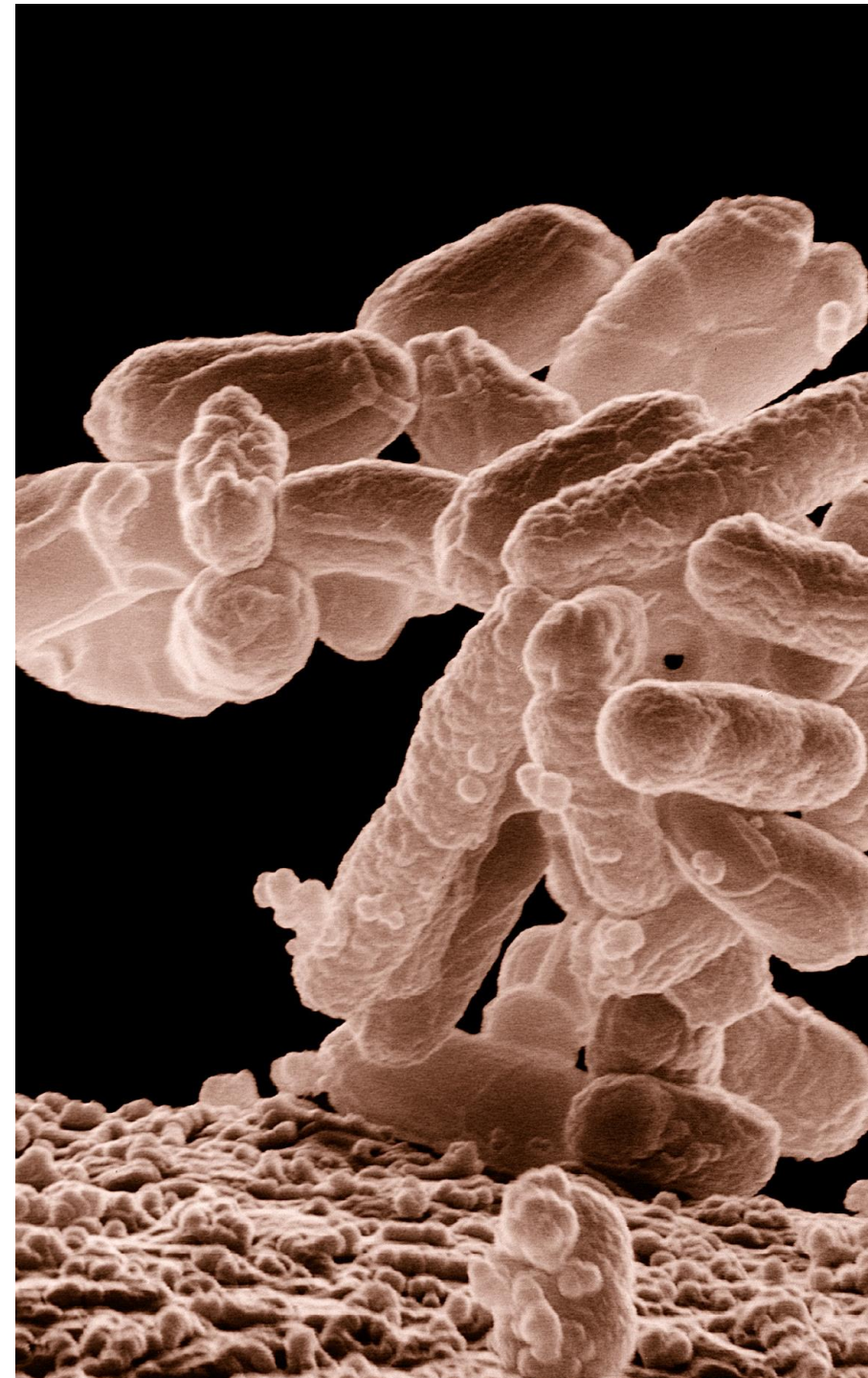
WHO'S THAT IN GRANNY'S KITCHEN?

A brief overview of drinking water sampling in NL



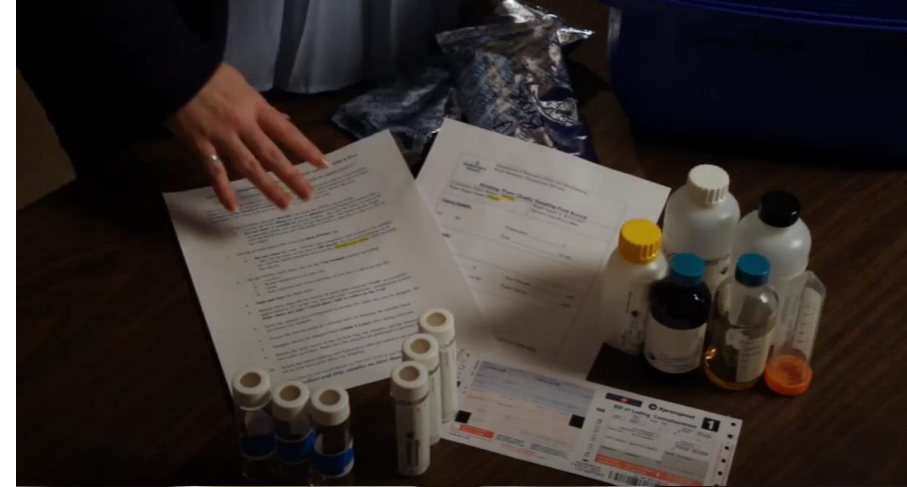
BACTERIOLOGICAL WATER QUALITY SAMPLING

- Environmental Health Officers with DGSNL (Taps)
 - Test for bacteria
 - Check chlorine levels
- Frequency: depends on population
- BWA issued when
 - testing detects higher than accepted amounts of coliforms
 - deficiencies with regard to disinfection



CHEMICAL & PHYSICAL WATER QUALITY SAMPLING

- Environmental Scientists with ECC (Taps, Sources)
 - Inorganics (ie. nutrients, metals, radiological parameters)
 - DBPs
 - Check chlorine levels
 - Special parameters
- Source water sampled every three years
- Frequency: 1-4 times a year seasonally
- DHCS handles DW health impacts



GUIDELINES FOR CANADIAN DRINKING WATER QUALITY

- What are GCDWQs?
- Established by the Federal-Provincial-Territorial Committee on Drinking Water (CDW)
- Published by Health Canada



Guidelines for Canadian Drinking Water Quality Summary Table

Prepared by

Health Canada

In collaboration with the

Federal-Provincial-Territorial Committee on Drinking Water

of the

Federal-Provincial-Territorial Committee on Health and the Environment

September 2020



Guidelines for Canadian Drinking Water Quality

Summary Table (September 2020)

Type ¹	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Applying the Guideline/Comments
I	Iron (1978, 2005)		AO: ≤ 0.3	Naturally occurring (erosion and weathering of rocks and minerals); acidic mine water drainage, landfill leachates, sewage effluents and iron-related industries	No evidence exists of dietary iron toxicity in the general population.	Based on taste and staining of laundry and plumbing fixtures.
I	Lead (2019)	0.005 ALARA		Leaching from plumbing (lead service lines, lead solder and brass fittings)	Health basis of MAC: Reduced intelligence in children measured as decreases in IQ is the most sensitive and well established health effect of lead exposure. There is no known safe exposure level to lead. Other: Possible effects include behavioral effects in children. Reduced cognition, increased blood pressure, and renal dysfunction in adults are also possible; classified as probably carcinogenic to humans	MAC is for total lead. Lead levels should be kept as low as reasonably achievable. Sampling should be done at the tap to reflect average exposure. The most significant contribution of lead in drinking water is generally from the lead service line that supplies drinking water to the home. The best approach to minimize exposure to lead from drinking water is to remove the full lead service line. Drinking water treatment devices are also an effective option.
I	Magnesium (1978)	None required		Naturally occurring (erosion and weathering of rocks and minerals)	No evidence of adverse health effects from magnesium in drinking water, therefore a guideline value is not necessary.	No additional comments.
P	Malathion (1986, 2005)	0.19		Leaching and/or runoff from agricultural and other uses	Health Basis of MAC: Nervous system effects (cholinesterase inhibition)	Not expected to leach into groundwater.
I	Manganese (2019)	0.12	AO: ≤ 0.02	Dissolution of naturally occurring minerals commonly found in soil and rock. Other sources include industrial discharge, mining activities and leaching from landfills.	Health Basis of MAC: Effects on neurological development and behaviour; deficits in memory, attention, and motor skills. Other: Formula-fed infants (where water containing manganese at levels above the MAC is used to prepare formula) may be especially at risk.	AO based on minimizing the occurrence of discoloured water, consumer complaints and staining of laundry.

GUIDELINES FOR DRINKING WATER QUALITY in NL

- Guidelines used by the Government of Newfoundland and Labrador for drinking water quality are based on the “Guidelines for Canadian Drinking Water Quality”

Effective date: September 1, 2020

- Recent changes to guidelines:
 - Manganese
 - Lead
 - Copper

Guidelines for Drinking Water Quality in Newfoundland & Labrador



Department of Environment, Climate Change and Municipalities
Water Resources Management Division

Effective Date:	September 1, 2020
Version Control:	Replaces: <ul style="list-style-type: none">• Guidelines for Drinking Water Quality in NL, 2017• Standard for Chemical and Physical Monitoring, 2001

Chemical Parameters	MAC (mg/L)	Other Value (mg/L)
Aluminum	None	OG: < 0.1 (conventional treatment)
Antimony	0.006	None
Arsenic	0.01	None
Barium	2.0	None
Boron	5.0	None
Cadmium	0.007	None
Chloride	None	AO \leq 250
Chromium	0.05	None
Copper	2.0	AO: 1
Fluoride	1.5	None
Iron	None	AO: \leq 0.3
Lead	0.005	None
Manganese	0.12	AO: \leq 0.02
Mercury	0.001	None
Nitrate and Nitrite	10	None
Selenium	0.05	None
Sodium	None	AO: \leq 200
Strontium	7.0	None
Sulphate	None	AO: \leq 500
Uranium	0.02	None
Zinc	None	AO: \leq 5.0

Physical Parameters	MAC (mg/L)	Other Value (mg/L)
Colour	None	AO: \leq 15 TCU
pH	None	6.5-8.5 (no units)
Total Dissolved Solids	None	AO: \leq 500
Turbidity	None	To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Disinfection By-Product Parameters	MAC (μ g/L)	Other Value (mg/L)
Trihalomethanes	100 *	None
Haloacetic Acids	80 *	None

* Expressed as a locational running annual average of quarterly samples, collected at a point of the highest formation potential. A minimum of four samples per year, one in each season are required to determine if a particular water supply meets or exceeds the recommended limit.

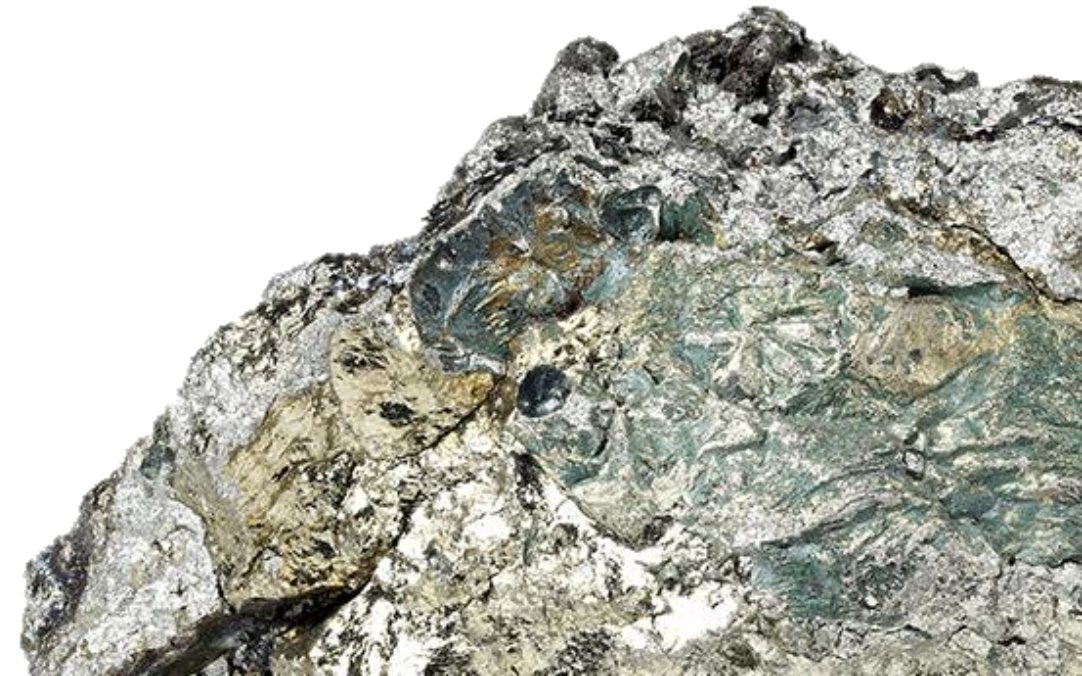
Types of Drinking Water Guidelines (MAC - AO - OG)



- **Maximum Acceptable Concentration (MAC)**
 - known or suspected adverse health effects of some people
 - Each MAC derived to safeguard health
- **Aesthetic Objective (AO)**
 - can affect its acceptance by consumers; public perception
 - generally do not pose any health effects
- **Operational Guidance (OG) Value**
 - effective use of treatment systems

MANGANESE (MAC = 0.12 mg/L)

- Occurs naturally in the environment; can be from human activities
- **Prior to 2019:** AO = 0.05 mg/L (i.e. did not consider any risk to human health)
- **Health Canada's May 2019 GCDWQ Guideline Technical Document for Manganese:**
 - AO = 0.02 mg/L
 - MAC = 0.12 mg/L



MANGANESE

(Aesthetic Considerations)

- consumer complaints regarding discolored water
 - brownish stains in laundered clothing
 - leave black particles on plumbing fixtures
- AO = 0.02 mg/L intended to
 - minimize the occurrence of discoloured water complaints
 - improve consumer confidence



MANGANESE

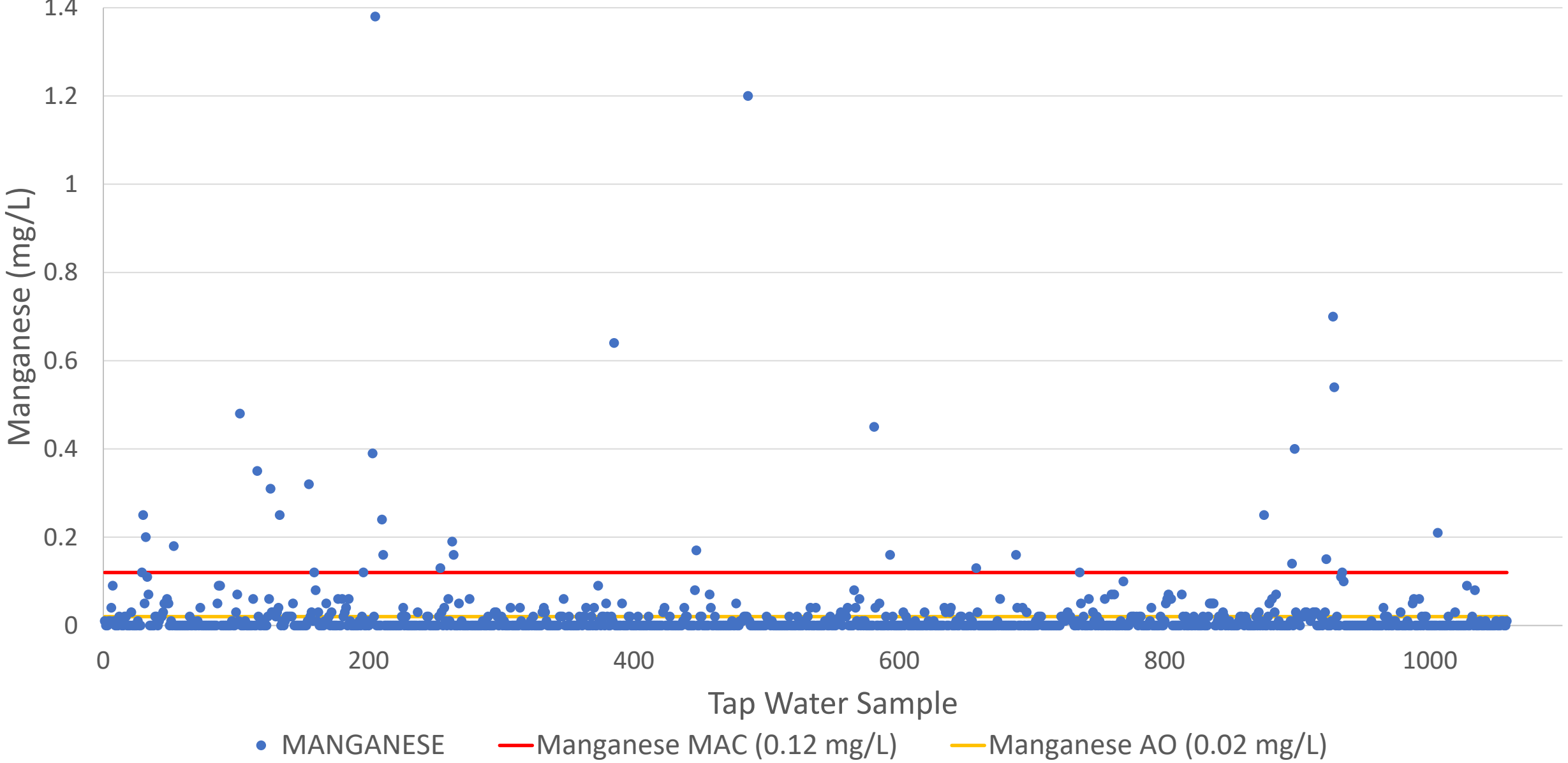
(Health Considerations)

- MAC of 0.12 mg/L based on **new science** suggesting potential adverse health effects on the central nervous system (particularly during brain development)
 - Symptoms: memory, attention or motor skills deficit
 - Do not use for baby formula
- Bathing and showering is considered safe
- Note: Health's Canada's MAC is one of the lowest limits in the world:
 - US health advisory = 0.3 mg/L
 - Australia's = 0.5 mg/L



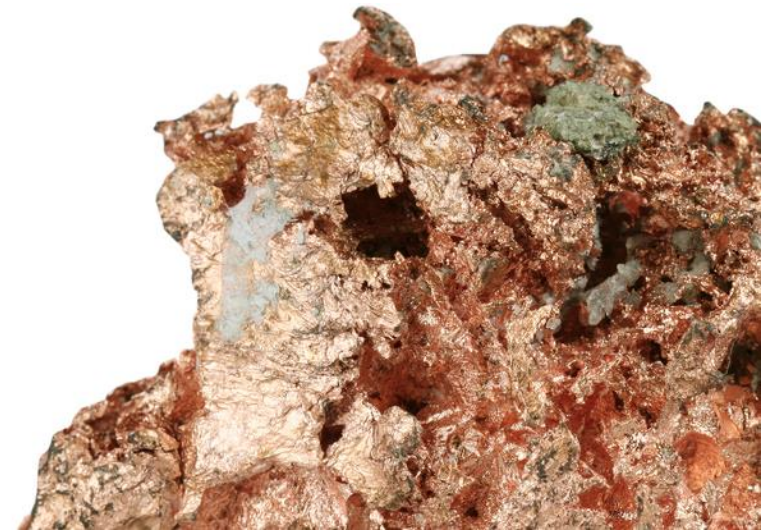
Manganese Concentration in Tap Water Samples

Fiscal Year 2020-21: 29 MAC Exceedances, 244 AO exceedances



COPPER (MAC = 2 mg/L)

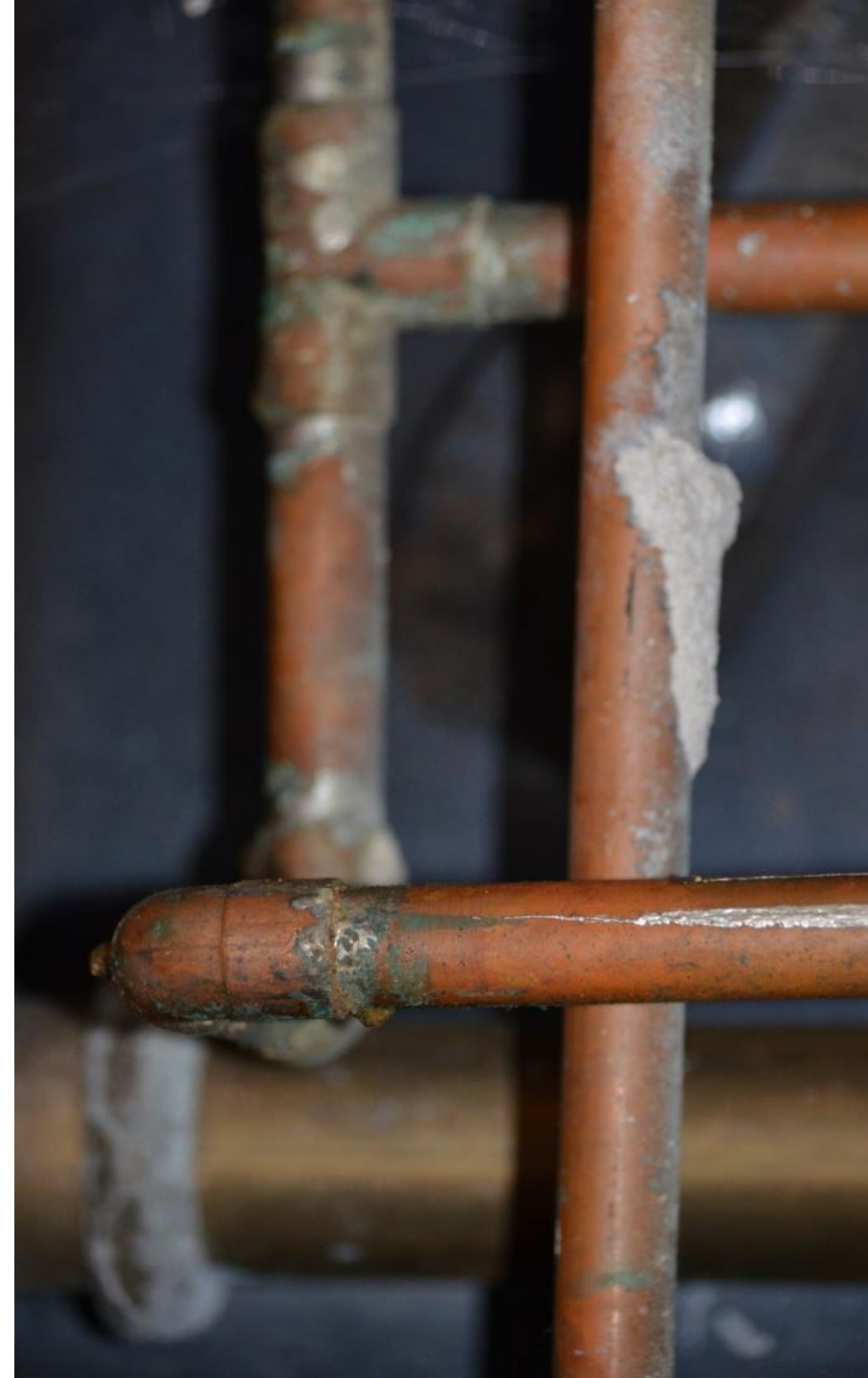
- Can occur naturally, major source is copper pipes
 - water chemistry, age, time
- **Prior to 2019:** AO = 1 mg/L
- **Health Canada's May 2019 GCDWQ Guideline Technical Document for Manganese:**
 - AO = 1 mg/L
 - MAC = 2 mg/L



COPPER

(Aesthetic Considerations)

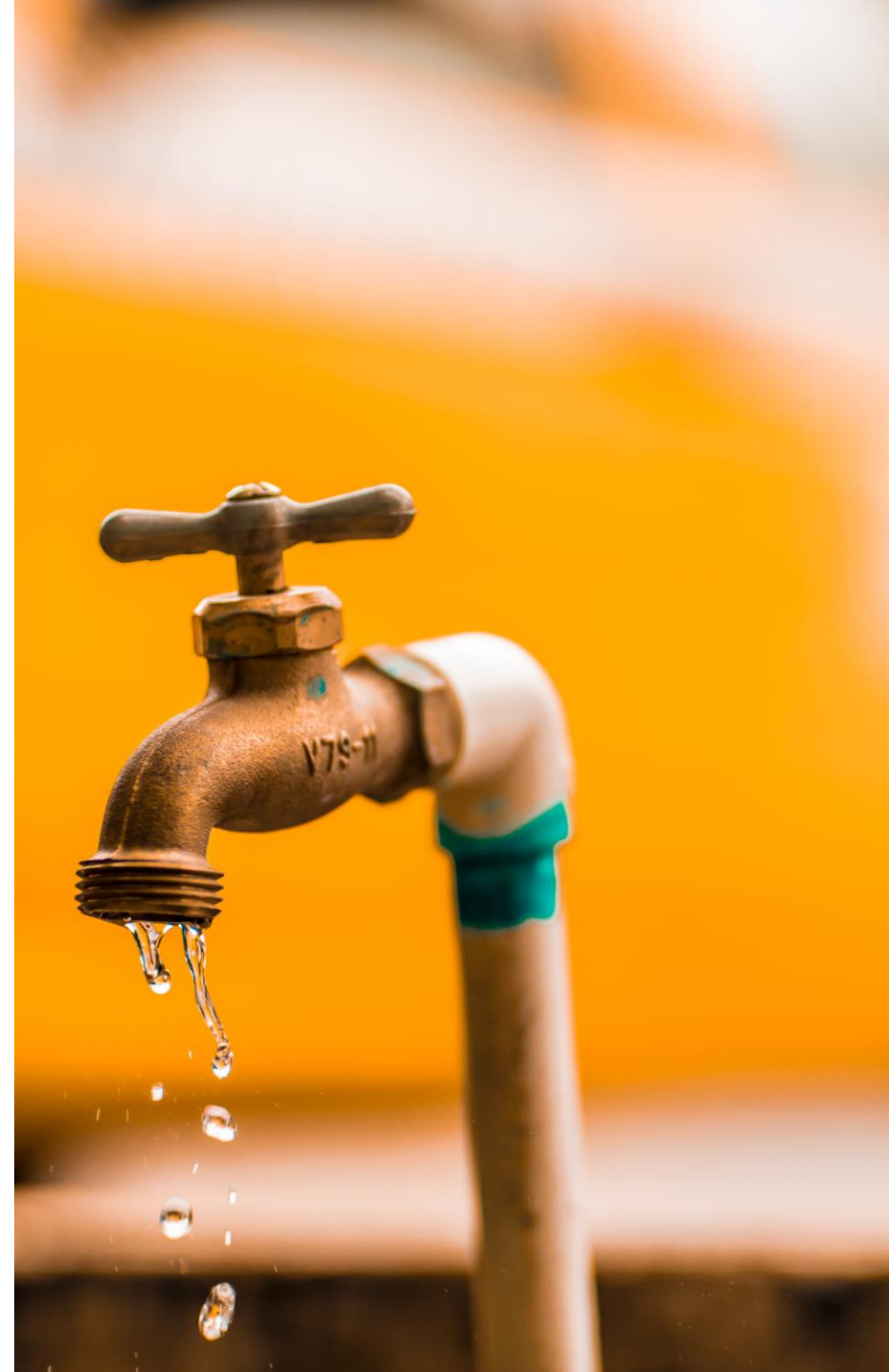
- Consumer complaints
 - causing blue/green staining of laundry and plumbing fixtures
 - taste issues metallic, bitter taste
- Health Canada established an AO = 1 mg/L
 - minimize the occurrence of staining and taste complaints
 - improve consumer confidence



COPPER

(Health Considerations)

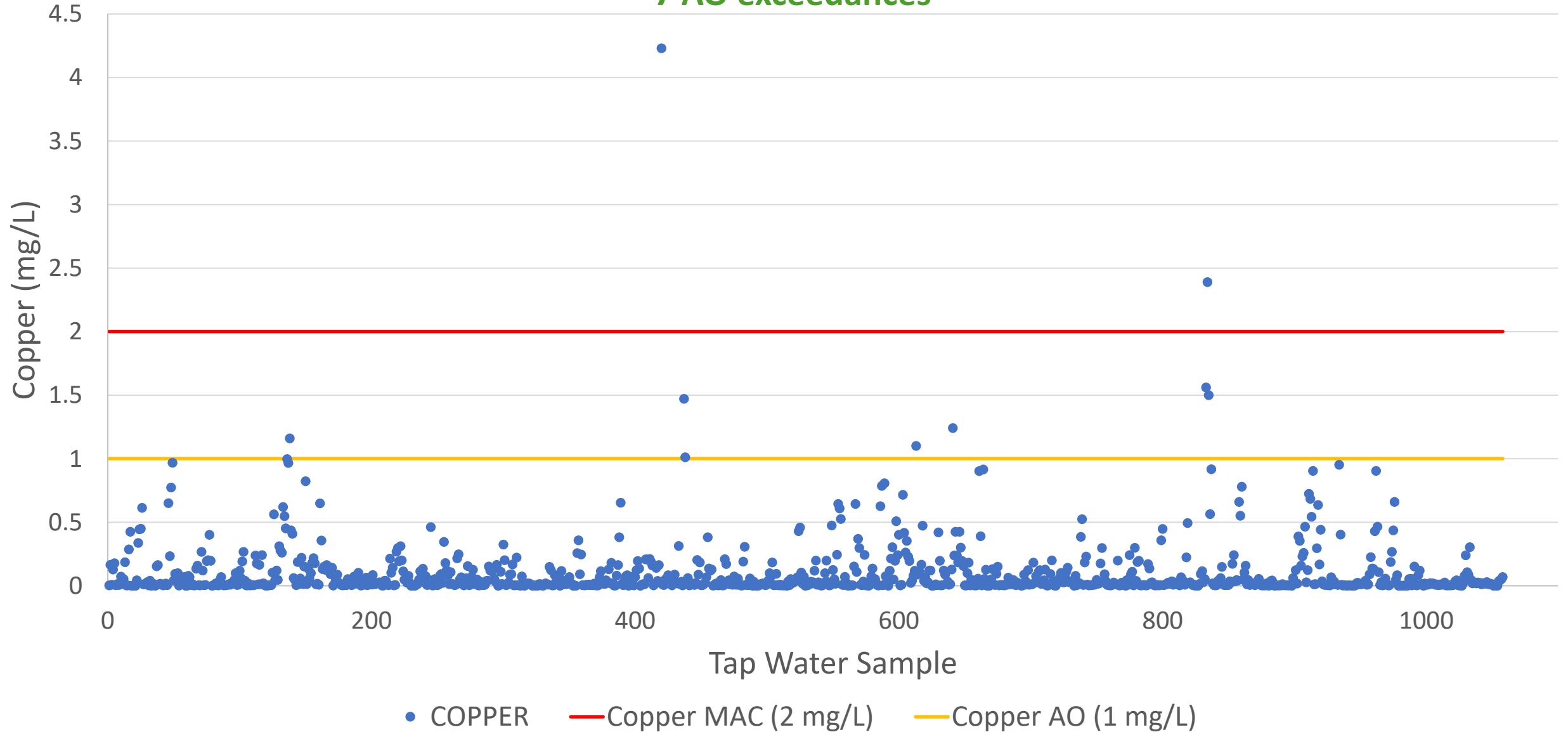
- Based on recent scientific studies on copper showing negative health effects related to exposure to high levels of copper in drinking water
 - Short term: gastrointestinal discomfort; nausea
 - Long-term: liver & kidneys
- MAC of 2 mg/L is protective of the health of Canadians, including the most vulnerable members of society (e.g. infants)



Copper Concentration in Tap Water Samples

Fiscal Year 2020-21: 2 Copper MAC Exceedances

7 AO exceedances



LEAD (MAC = 0.005 mg/L)

- Occurs both naturally and as a result of human activities
- Most common occurrence in NL:
 - leaching from distribution & plumbing system components
 - service lines, solders and fittings
- **Prior to 2019: MAC = 0.01 mg/L (set in 1992)**
- **Revised MAC = 0.005 mg/L**



LEAD

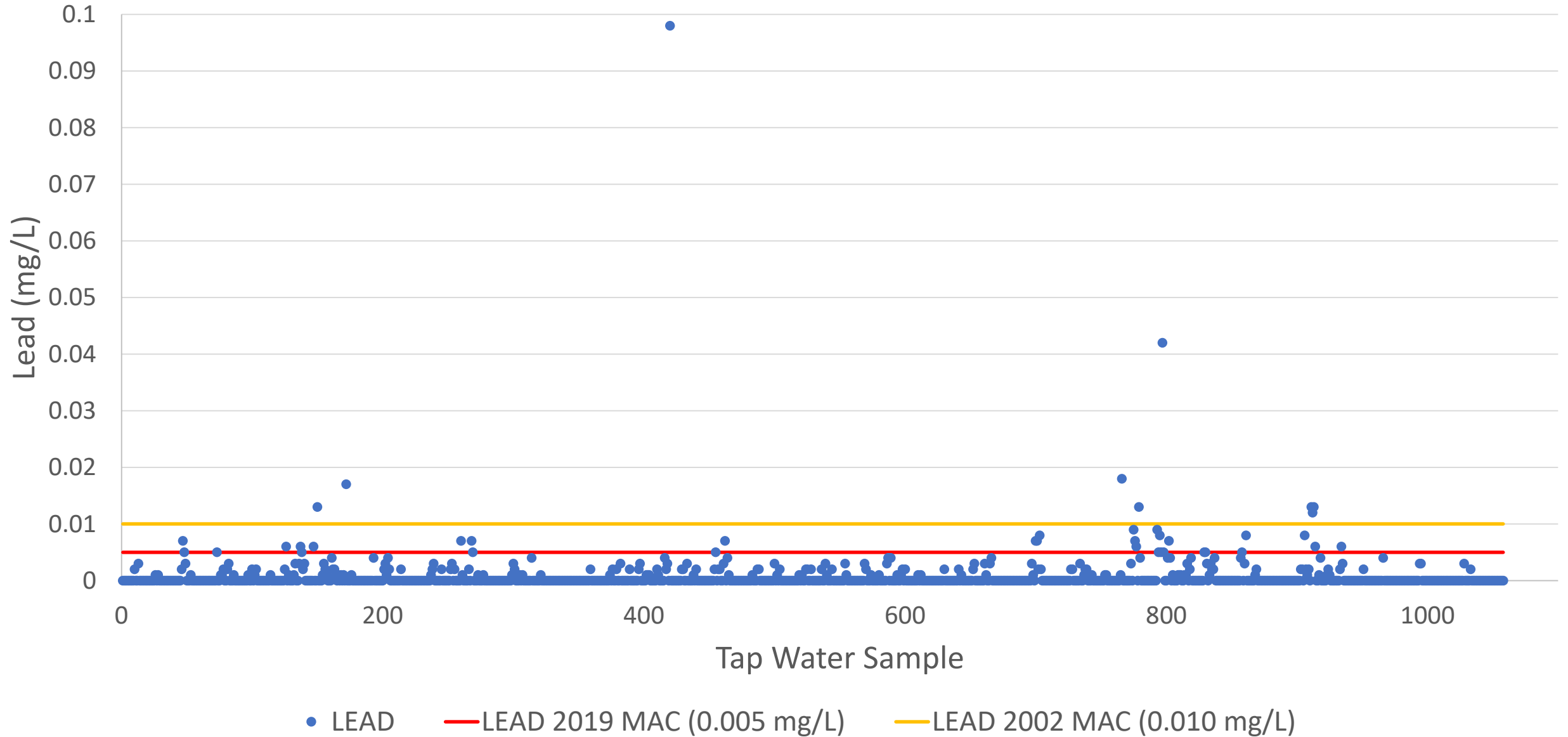
(Health Considerations)

- High toxicity well known; lead poisoning
 - Probably carcinogenic
 - Adverse cognitive and behavioral effects in children; lower IQs has been associated with higher BLL
- MAC for lead of 0.005 mg/L established based on analytical limitations and feasibility
- Safe level can be identified, ALARA



Lead Concentration in Tap Water Samples

(Fiscal Year 2020-21: 29 Lead MAC Exceedances)





EXCEEDANCE REPORTING

**A brief overview of how and when
communities are informed of a
MAC Exceedance**

EXCEEDANCE REPORTING



3/15/2022

Contaminant Exceedance Report Number 2022-001

To: Joe Smith
LSD of Pondwater

Table 1 contains the result of a regularly scheduled drinking water quality sample that exceeded the Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentration (MAC) for lead in drinking water.

Table 1: Sampling Result

Community	Water Supply	Date of Sampling	Sample Number	Parameter	Sample Result (mg/L)	MAC (mg/L)	Type of Sample
Pondwater	Deep Pond	March 1, 2022	2022-0001-03-TI-RE	Lead	0.008	0.005	Tap

Exceedances above the MAC have not been detected in the past.
As per department protocol, a resample **will** be collected.
At this time, no other contaminants are reported to be above the recommended limits.

A copy of this letter has been forwarded to Douglas Howse, Manager of Environmental Health, who is available to provide you with more information on any necessary precautions and/or potential health implications. If required Douglas Howse may be contacted via: douglashowse@gov.nl.ca or (709) 729-3422.

If you have any questions or require further information on the drinking water quality sampling program, please contact Christa Skinner at ChristaVSkinner@gov.nl.ca

Please acknowledge receipt of this document by signing this page and returning to ChristaVSkinner@gov.nl.ca

All pages received in good order on: _____

Comments: _____

Signature: _____ Name (Please Print): _____

- Provided to communities when a chemical analysis result > MAC
- E-mailed, faxed or mailed to the community as soon as the department receives the results
- 70 reports sent out in 2020-21
 - 9 arsenic, 29 lead, 1 fluoride, 29 manganese and 2 copper

Source Water Quality for Public Water Supplies in Newfoundland and Labrador

Physical Parameters and Major Ions

Serviced Area(s)	Source Name	Sample Date	Alkalinity	Colour	Conductivity	Hardness	pH	TDS	TSS	Turbidity	Boron	Bromide	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulphate
			Units	mg/L	TCU	µS/cm	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Guidelines for Canadian Drinking Water Quality				15			6.5 - 8.5	500		1.0	5.0		250	1.5			200	500
Aesthetic (A) or Contaminant (C) Parameter				A			A	A		C	C		A	C			A	A
Avondale																		
Avondale	Lees Pond	Aug 23, 2021	9.10	13	45.0	7.40	6.84	25		0.49	LTD	LTD	2.00	9	LTD	LTD	6	LTD
Bay de Verde																		
Bay de Verde	Island Pond	Sep 23, 2021	LTD	<u>25</u>	51.0	3.60	<u>6.11</u>	28		1.10	LTD	LTD	0.35	13	LTD	LTD	7	2
Bellburns																		
Bellburns	Bound Brook Tributary	Sep 09, 2021	160.00	<u>49</u>	340.0	160.00	8.17	190		0.54	LTD	LTD	46.00	12	LTD	LTD	8	2
Bellevue Beach																		
Bellevue Beach	Unnamed Brook	Sep 21, 2021	LTD	<u>260</u>	53.0	8.90	<u>6.14</u>	29		1.00	LTD	LTD	2.00	11	LTD	LTD	7	1
Benton																		
Benton	Little Pond	Aug 23, 2021	5.00	<u>24</u>	57.0	6.10	6.67	25		0.67	LTD	LTD	2.00	16	LTD	LTD	26	3
Bird Cove																		
Bird Cove (+Brig Bay)	Inner Gilmour Pond	Sep 22, 2021	110.00	<u>54</u>	240.0	120.00	8.18	130		1.30	LTD	LTD	25.00	9	LTD	LTD	7	LTD
Biscay Bay																		
Biscay Bay	Unnamed Pond	Sep 22, 2021	49.0	<u>14</u>	100.0	9.80	6.80	37		1.40	LTD	LTD	0.00	7	LTD	LTD	7	LTD
Black Tickle-Domino																		
Black Tickle-Domino - Outside Tap	Martin's Pond - Tap at Pumphouse	Sep 16, 2021	9.50	<u>110</u>	67.0	8.00	<u>6.45</u>	37		30.00	LTD	LTD	1.20	13	LTD	LTD	9	LTD
Black Tickle-Domino - PWDU	Martin's Pond - Tap at Pumphouse	Sep 16, 2021	9.50	<u>110</u>	67.0	8.00	<u>6.45</u>	37		30.00	LTD	LTD	1.20	13	LTD	LTD	9	LTD
Branch																		
Branch	Valley Pond	Aug 09, 2021	9.60	<u>43</u>	66.0	12.00	6.85	37		0.82	LTD	LTD	2.60	14	LTD	LTD	8	2
Brig Bay																		
Brig Bay	Inner Gilmour Pond	Sep 22, 2021	110.00	<u>54</u>	240.0	120.00	8.18	130		1.30	LTD	LTD	25.00	9	LTD	LTD	7	LTD
Brigus																		
Brigus (+Cupids, +South River)	Brigus Long Pond (to Brigus)	Aug 26, 2021	9.90	<u>21</u>	37.0	6.40	6.81	21		0.73	LTD	LTD	1.40	7	LTD	LTD	5	LTD
Buchans Junction																		
Buchans Junction	Lapland Pond	Aug 16, 2021	9.70	<u>23</u>	18.0	6.90	6.81	10		2.80	LTD	LTD	2.10	2	LTD	LTD	1	LTD

WHERE DO I FIND MY DATA?

SEASONAL UPDATES & THE PORTAL

SEASONAL UPDATES

- Paperless reporting
- E-mails sent to communities when seasonal data is updated
- Summary tables for source water and tap samples
- Reports clearly indicate parameters that exceed



[Environment and Climate Change](#) > [Water Resources Management](#) > [Water Quality](#) > [Drinking Water](#) > [Drinking Water Quality Data](#)

Drinking Water Quality Data

- [Chemical Drinking Water Quality Monitoring Schedule](#)
- [Drinking Water Quality Monitoring Manual](#)
- [Special Parameter Monitoring](#)

The Department of Environment and Climate Change in partnership with municipal governments monitors source and tap water quality of public water supplies on a regular basis. The collected data is used to ensure compliance with the "[Guidelines for Canadian Drinking Water Quality](#)" [\[PDF\]](#) and to take appropriate measures to address emerging drinking water quality issues. The data is provided to the public on a regular basis through this web page.

The data below is for all sampling carried out up to September 30, 2021

The Drinking Water Quality data shown on this page is now also available via the [Newfoundland and Labrador Water Resources Portal](#). Using the Community Water Resources Reports feature a Community can be selected to generate reports that show all of the Drinking Water Quality data the Department has collected for that community.

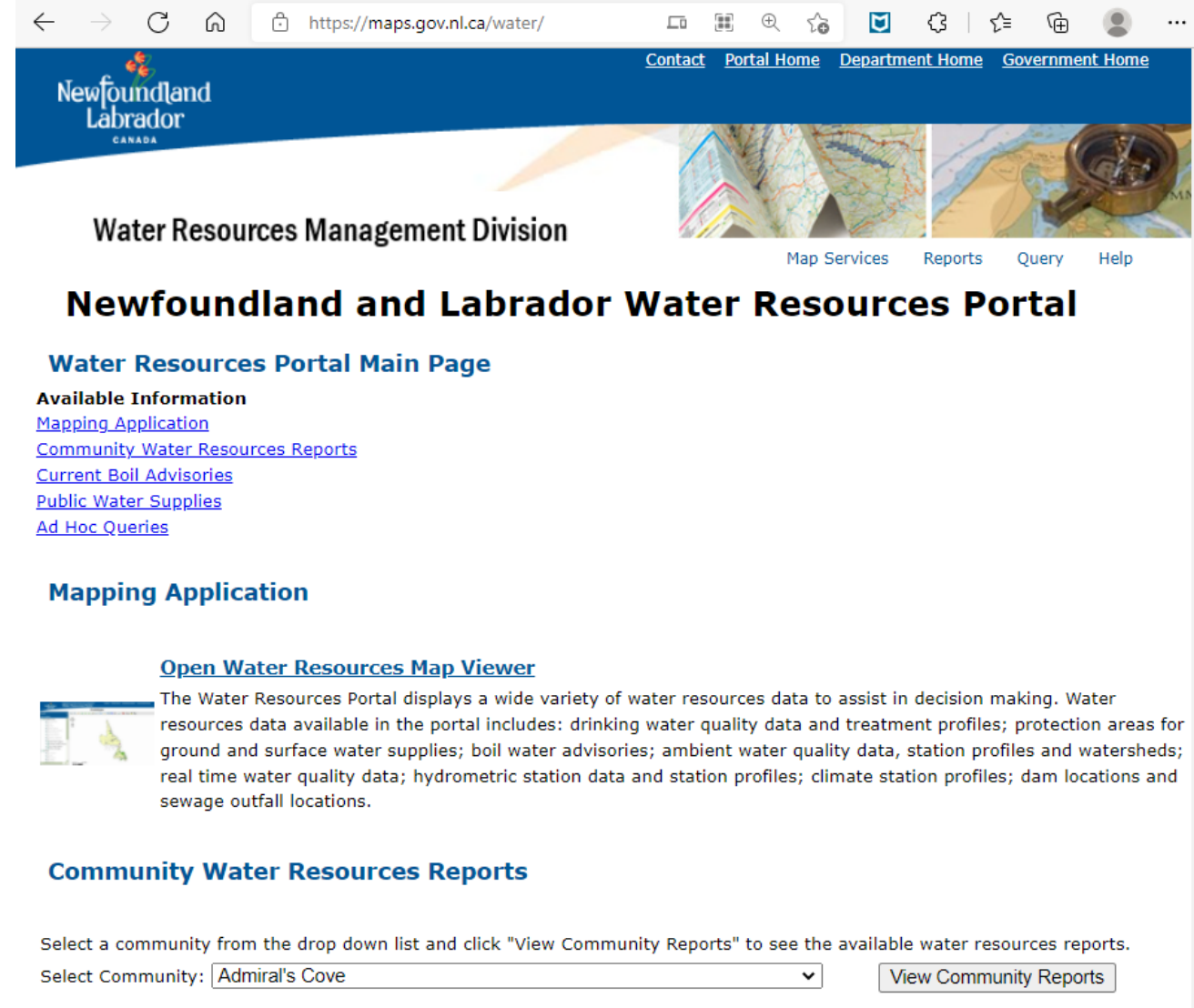
To see when your community has been sampled please refer to the [Sampling Schedule web page](#).

These documents are in Adobe PDF format and, if you have an older browser, may require the free Adobe Acrobat Reader to view and print. Click on the hyperlinks below to download each document for viewing and printing.

<https://www.gov.nl.ca/ecc/waterres/quality/drinkingwater/chemical/>

WATER RESOURCES PORTAL

- User Friendly
- Gives a full history
- Can be downloaded to Excel



The screenshot shows the website for the Water Resources Management Division of Newfoundland and Labrador. The page features a blue header with the department's logo and navigation links. The main content area includes a title, a list of available information links, a section for the mapping application with a description and a small image, and a section for community water resources reports with a dropdown menu and a button.

https://maps.gov.nl.ca/water/

Contact Portal Home Department Home Government Home

Newfoundland
Labrador
CANADA

Water Resources Management Division

Map Services Reports Query Help

Newfoundland and Labrador Water Resources Portal

Water Resources Portal Main Page

Available Information

- [Mapping Application](#)
- [Community Water Resources Reports](#)
- [Current Boil Advisories](#)
- [Public Water Supplies](#)
- [Ad Hoc Queries](#)

Mapping Application

[Open Water Resources Map Viewer](#)

The Water Resources Portal displays a wide variety of water resources data to assist in decision making. Water resources data available in the portal includes: drinking water quality data and treatment profiles; protection areas for ground and surface water supplies; boil water advisories; ambient water quality data, station profiles and watersheds; real time water quality data; hydrometric station data and station profiles; climate station profiles; dam locations and sewage outfall locations.

Community Water Resources Reports

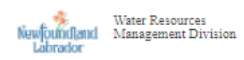
Select a community from the drop down list and click "View Community Reports" to see the available water resources reports.

Select Community:

<https://maps.gov.nl.ca/water/>

Main Report

St. John's



Tap Water Quality for Public Water Supplies Physical Parameters and Major Ions

Sample Date	Alkalinity	Color	Conductivity	Hardness	pH	TDS	TSS	Turbidity	Boron	Bromide	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulphate
Units	mg/L	TCU	µS/cm	mg/L		mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Guidelines for Canadian Drinking Water Quality		15			6.5 - 8.5	500		1.0	5.0			250	1.5		200	500
Aesthetic(A) Parameter or Contaminant (C)		A			A	A		C	C			A	C		A	A

Community Name: St. John's
 Service Area: St. John's
 Supply Name: Petty Harbour Long Pond

Aug 24, 2021	40.00	0	100.0	39.00	7.7	57		0.48	0.00	0.00	15.00	11	0.000		5	0
Jun 02, 2021	35.00	0	99.0	38.00	7.6	55		0.38	0.00	0.00	14.00	10	0.000		5	2
Jan 28, 2021	33.00	0	105.0	38.00	7.6	68		0.20	0.00	0.00	15.00	12	0.000	0.000	5	1
Nov 25, 2020	32.00	0	98.0	35.00	7.7	62		0.20	0.00	0.00	14.00	11	0.000	0.000	5	1
Sep 16, 2020	28.00	8	108.0	32.00	7.5	69		0.30	0.00	0.00	13.00	12	0.000	0.000	5	1
May 13, 2020	38.00	0	111.0	40.00	7.6	72		0.20	0.00	0.00	16.00	11	0.000	0.000	4	1
Feb 25, 2020	37.00	0	108.0	35.00	7.9	69		0.40	0.00	0.00	14.00	12	0.000	0.000	5	1
Nov 13, 2019	35.00	0	104.0	40.00	7.6	68		0.30	0.00	0.00	16.00	12	0.000	0.000	5	1
Aug 13, 2019	36.00	0	110.0	40.00	7.8	72		0.70	0.00	0.00	16.00	11	0.000	0.000	5	1

QUESTIONS?

